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GRIZZLY BEAR HABITAT ANALYSIS SOUTH FORK FLATHEAD RIVER, MONTANA

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Final REport for Cooperative Agreement
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SOUTH FORK FLATHEAD RIVER, MONTANA

By

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March, 1987

ABSTRACT

Grizzly bear radio location points are used to evaluate a habitat classification based on plant community types (c.t.). The assumptions of analysis are that grizzly bears select the c.t. or combination of c.t.'s best suited to satisfying daily requirements from among those readily available, and that habitat selection changes seasonally as requirements change.

Data describing plant community types are presented. Discriminant function analysis is used to identify c.t.'s important during two seasonal periods (pre-berry and berry), and, using these c.t.'s, to correctly classify habitat selection. Habitat use by individual bears is compared with use by all bears combined. Minimum correct classification for individual bears in the pre-berry season is 78.6 percent percent, and for bears combined is 67.8 percent. Maximum classification for individual bears in the berry season is 100.0 percent, and for bears combined is 90.5 percent.

In separate tests, Spearman's rank correlation was used to test the functional relationships between c.t. importance values (CTIV) and the frequency of bear use of discrete c.t.'s, and of mean areas of c.t.'s found within 100 acre scan circles. CTIV's were significantly and positively correlated in the berry seasons for both tests. No relationship was found between CTIV's and bear use of c.t.'s, or the occurence of c.t.'s within scan circles, for the pre-berry season. These results are shown to be related to known physiological and behavioral requirements of grizzly bears.

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Finally, we would like to thank Dr. L. Jack Lyon, USFS Forest Sciences Laboratory, for acting as sponsor and contract supervisor. His support and interest brought this project to life.

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INTRODUCTION

Evaluation of grizzly bear habitat has evolved rapidly over the past decade from fairly simplistic, broad-brush approaches (Mealey et al. 1976) to increasingly more complex and quantitative measurement (USDA 1979, Zager et al. 1980, Madel 1982, Christiansen 1982). The current state of the art includes computer modeling of habitat effectiveness, and computer facilitated interpretation of LANDSAT satellite imagery (USDA 1985, Craighead et al. 1982). While the sophistication of analytic and managerial tools have evolved, however, efforts to develop and test measures of grizzly bear habitat have lagged behind (Hadden 1987). This situation is gradually being improved by a developing body of habitat research.

Several habitat measurement and assessment techniques were presented in May, 1985, at the Grizzly Bear Habitat Symposium, in Missoula, Montana. (Banner et al. 1986, Craighead et al. 1986, Despain 1986, Hadden et al. 1986, Mattson 1986). These papers covered the landscape of grizzly bear habitat in Northwest North America, from the Canadian West Coast and Rocky Mountains, to Yellowstone National Park. These authors recognized the trend toward increasing management sophistication, and their measurement of habitat reflected this finer view of the grizzly bear's world.

We initiated this research as a one year pilot project to further develop and test the habitat assessment techniques of Hadden et al. (1986) using a historical data set of grizzly bear radio locations. This approach employs a hierarchical habitat classification of vegetation types at various succession stages. Plant community types (c.t.) are defined by floristic characteristics within this framework, and represent the lowest level of habitat stratification. Community types are evaluated as grizzly bear habitat by a criteria which includes the occurrence, abundance, and nutritive content of bear food plants within c.t.'s, as well as nutritional value of these food items to the bear.

In testing this habitat evaluation we have adopted the view of Lyon (1985) that grizzly bears probably select that combination of habitat components (that is, community types) best suited to satisfying daily requirements from among the

components readily available, and that habitat selection will change seasonally as requirements change.

OBJECTIVES

Our objectives were three-fold:

1. To derive seasonal importance values for community types based on the abundance, availability, and nutritive content of important grizzly bear food plants, and

2. To determine if community type importance values are positively correlated with the frequency of community types used by bears; and

3. To Determine if the combinations and extent of community types found in 100 acre scan areas surrounding bear locations is sufficient to indicate changes in seasonal habitat requirements of bears.

STUDY AREA

The study area (Fig. 1) is located in the South Fork of the Flathead River (SFFR) drainage in northwest Montana. It extends from Wheeler Cr. south to the head of Sullivan Cr. and from the Swan Divide east to Hungry Horse Reservoir (HHR). Elevations range from 1097m at HHR to approximately 2134m on the Swan Divide. The area is within the Hungry Horse and Spotted Bear Ranger Districts of the Flathead National Forest. There are no private lands located in the study area. The Forest Service manages the area primarily for timber harvest and recreation. Hunting is a major recreational activity during the fall.

The study area is characterized by high peaks and occasional cirque basins along the Swan Divide, and an extensive ridge systems dividing numerous drainages. The steep slopes contain numerous avalanche chutes and open south facing parks. Open rocklands occur in the higher elevations and ridge tops.

The area is influenced by Pacific Maritime weather patterns. Although weather in the study area is significantly more severe (Chadwick 1973), records from the Hungry Horse Dam Weather Station, approximately 32km northwest of the study area, show mean temperatures of 69°F during August and 22°F during January. Yearly precipitation averages 81.71cm at the Dam (calculated from 1969-1985 precipitation data, Climatological Data Annual Summaries, Montana. NOAA National Climatic Data Center, Ashville, N. Carolina). Average spring snow depth (1 April) at the Twin Cr. Snow Course is 74.7cm (calculated from 1951-1985 Snow Course Data, Soil Conservation Service, Bozeman, Montana.). Tables 1 and 2 present detailed long-term and monthly precipitation and spring snow depth data at the Dam and Twin Creeks.

Vegetation on the SFFR study area is characterized by the spruce/fir (*Picea englemannii/Abies lasiocarpa*) forest type. Drier, low elevation sites are dominated by Douglas fir (*Pseudotsuga menziesii*) types. Plant community types range from open rock and grassland types to dense shrubfields and closed canopy mature

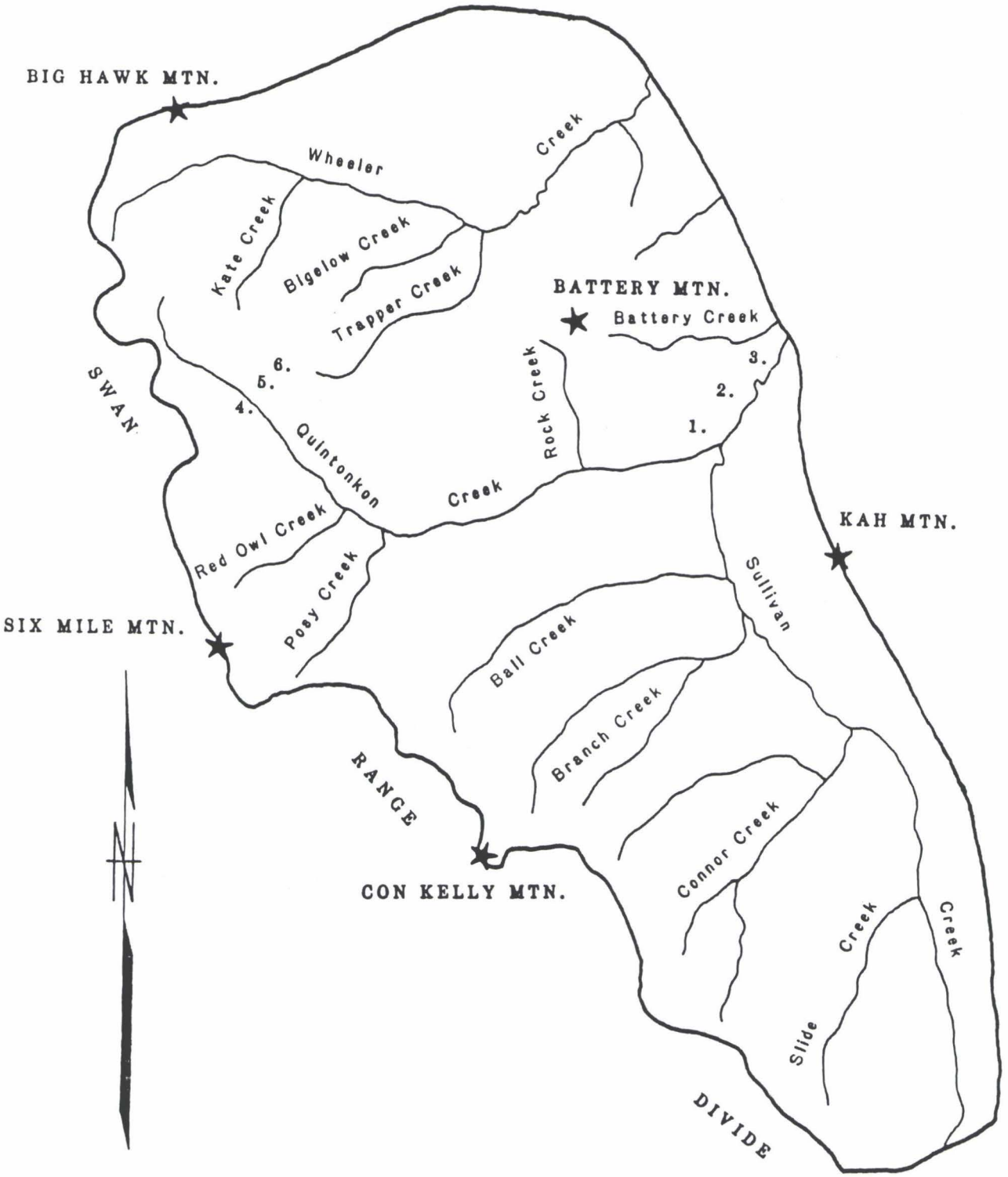

Figure 1. South Fork of the Flathead River study area, with permanent phenology plots shown.

Table 1: Long-term average (1969-1985) monthly precipitation, and 1986 monthly precipitation, Hungry Horse Dam, S. Fk. Flathead River.

Month	Average(cm) (1969-1985)	1986
January	9.42	9.42
February	6.81	10.87
March	5.66	5.87
April	55.74	4.24
May	7.57	8.02
June	8.84	4.06
July	5.36	8.94
August	5.03	0.13
September	7.39	12.40
October	6.43	5.61
November	14.55	-
December	9.75	-
Total	81.71	69.56

Table 2: Snow Course Data (1951-1985) at Twin Creeks, S. Fk. Flathead River (Elev. 3580).

Month	Average(cm) (1951-1985)	1986
1 March	89.7	66.0
1 April	74.7	0.0

forest. Road access in the study area is good, however, some roads are closed on a seasonal or permanent basis. An extensive trail system also exists, however, poor maintenance makes travel hazardous.

METHODS

This research project was undertaken in seven steps:

* collecting vegetation data,
* analyzing and classifying vegetation data,
* constructing a computerized (digitized) vegetation map of the study area based on plant community types,
* deriving grizzly bear food values,
* selecting grizzly bear radio locations,
* estimating the seasonal availability of grizzly bear food items, and
* analyzing and interpreting grizzly bear radio locations.

Sampling the Vegetation

A rapid reconnaissance method was employed to gather vegetative data. This approach emphasized "characterizing" stands (Arno et al. 1986, O'brien and Van hooser 1983) based on dominant species' cover values. Total canopy cover was estimated in each stand for all species. Although an effort was made to key all taxa to species, not all were keyed to this level. Grasses, sedges, and rushes were difficult to accurately differentiate and quantify, using our rapid reconnaissance method. We collected unknown species and attempted to key them to genus and species level, however, in most cases their coverage was pooled by life form (i.e. grasses) or genus (i.e. *Carex* or *Juncus*).

Each stand was considered a "macro" plot, with entire stands (areas of homogeneous cover, structure, and species composition) serving as sample plots. Cover estimates were made after one or two surveys of the stand. Occasionally the entire stand was a mosaic of small, diverse communities not clearly distinguishable on 1:16,000 area photos. For these complex stands, each distinct community was examined separately, but the mosaic was mapped as a single unit, and labelled by the dominant type. Estimates of total cover for each species were made at the conclusion of the survey. Coverage classes were based on a 12-point

system: T=0-1%, P=1-5%, 1=5-15%, 2=15-25%, 3=25-35%, 4=35-45%, 5=45-55%, 6=55-65%, 7=65-75%, 8=75-85%, 9=85-95%, and F=95-100%.

Additional variables measured in each stand were:

A. For trees:

* height of dominant trees,
* total cover all trees,
* total tree canopy cover by size class, (seedling, sapling, pole, young, mature, dead),
* total canopy cover for individual trees species , and
* canopy cover for individual tree species by size class.

B. For shrubs, forbs, and grass-like plants:

* total canopy cover for each life form (shrub, forb, grass),
* canopy cover for all taxa, and
* life form of each taxa.

Data were also taken on site variables, including: slope, aspect, elevation, site treatment (if any), intensity of treatment, year of treatment, and percent cover of exposed rock, exposed soil, and dead and downed vegetative litter and debri. In addition, phenological data were taken on bear foods plants at grizzly bear feeding sites to complement the phenological data taken at fixed plots. Evidence of grizzly bear use was determined by the presence of hair, tracks or scat. Gregorian and Julian dates were recorded, and UTM coordinates were determined for a representative point in each stand.

The study area vegetation was sampled in one season, beginning June 2, and ending September 15, 1986. Forested and non-forested stands were sampled as they were encountered. An effort was made to plan a day's sampling along a route, determined in advance from an examination of aerial photographs. All age classes and habitat types were sampled during the course of the field work.

Classifying the Vegetation

A combination of objective and subjective methods were chosen to classify stand data into community types. Stands were initially assigned to a vegetation type (Rockland, Grassland, Shrubland, Forbland, or a forest Habitat Type (Pfister et al. 1977)) and to a successional class (1: grass-forb, 2: shrub-seedling, 3: sapling, 4: pole, or 5: mature). Cornell ecology programs TWINSPAN (Hill 1979a) and DECORANA (Hill 1979b) were then used for the next level of data sorting and classification. TWINSPAN is an agglomerative classification program which makes successive groupings of stands based on species similarity scores between stands. DECORANA produces an n-dimensional (up to four axis) ordination based on the reciprocal averaging of calculated sampled scores. Stands were plotted manually on scaled paper and provided a three dimensional view of stand relationships. DECORANA provided a perspective against which the TWINSPAN output and subjective groupings of stands can be weighed. Subjectives evaluation of stand location, history, treatment, and other factors were used to successively group stands (Gauch 1982, Pfister and Arno 1980).

Constructing and Digitizing the Vegetation Map

A vegetation map was constructed based upon stand sample data and extrapolation of our sampling experience to aerial photographs. As mentioned, stands were treated as sample plots. Hence, each sample unit (stand) was both a sample polygon and a map polygon. Delineation of stands was done at a fairly fine level of resolution, generally exceeding that of typical forest management. This approach reflected our objective of making the resulting communtiy type classification and map meaningful to bear ecology as well as to timber management and other management uses.

Once all map polygons were classified to community type, adjoining sample polygons were examined. Where adjacent sample polygons were the same c.t., the boundary between the two was erased.

Extrapolation of our community types to unsampled polygons (stands) was based upon a subjective interpretation of aerial photographs. Elevational zone, aspect,

slope, vegetation type, and stand structure (successional category) were the criteria used in assigning these polygons a c.t. identity.

All mapwork was initially done on the 1:16,000 color aerial photos, and then transfered to 1:24,000 USGS orthophoto quads. These hand-drafted maps were then digitized using the USFS, Region One, JELLY mapping system (Boller 1977). This system employs the "arch-node" method; line segments (archs) are digitized separately from one line intersection to another (nodes). System software then connects line segment data into sequentially labeled polygons. This method ensures that adjacent polygons share identical boundaries.

Deriving Grizzly Bear Food Values

Grizzly bear food habits were derived to quantify the seasonal dietary contribution of food plant taxa. We assumed that grizzly bears dietary requirements change during their active period and that distinct seasons could be postulated based upon these dietary requirements and the availability of plant food items (Neslon et al. 1984). We also assumed that grizzly bears make discrete choices of food items within a season, and further, that this selection process reflected the nutritional value of the food item to the bear. Our assessment of grizzly bear food habits, therefore, entailed four steps:

* determining grizzly bear food items,
* determining food item availability,
* determining the seasonal food value (FV_{ik}) of individual foods, and
* determining food item importance value ($FIIV_{ikj}$) and c.t. importance values ($CTIV_{ik}$) for all c.t.'s.

Grizzly bear diet items were determined from four sources: 1. scat data compiled for the South Fork of the Flathead River in the late 1970's (Mace and Jonkel 1980) in the literature, 3. observation of food items used by grizzly bears during our field season, and 4. the pooled knowledge of the principal investigators. These criteria present some problem, and are not completely satisfactory. Our objective was to develop as complete a list of grizzly bear food plants for our

study area as possible, as well as to account for apparent inconsistencies in existing data, (i.e. evidence of food item use in the scat data when phenological data indicated the food was not available).

Determining Food Item Availability

The availability of grizzly bear food plants was determined, in part, from plant phenology data collected during the course of the study. These data were limited, however, in that only a portion of food plants used in our analysis were present in phenology plots. We estimated the phenological development of species for which we had no data. These estimates were based upon similarity to other species, our casual observation of plant development during the summer, and the combined knowledge of the principal investigators.

Six permanent phenology plots (Fig. 1) were established in the Quintonkon Creek drainage of the study area. These plots were established on southeast and southwest facing aspects; elevations varied from 1113 m to 1939 m. Table 3 describes the physical characteristics of each plot.

Phenology plots were established in May and checked biweekly until June, after which they were checked on a weekly basis. Appendix A includes the common and scientific names and symbols of all species included in the phenology studies. Vegetative growth, floral development and fruit/seed development were the major stages that were recorded during field work. Vegetative growth included bud burst to mature leaf. Floral development included bud burst to floral senescence, and fruit/seed development included floral senescence to ripe fruit or seed. For a more thorough description of phenology stages used in this study see Carriles (In Prep.). The peak of development for each major phenology stage was reached when 50 percent of the plants in a plot had reached that stage of development.

Bear food plants were available if they were physically present during the particular season, were at the preferred phenological stage (as determined by scat analysis, Mace and Jonkel 1983), and at or near their nutritional peak. Occasionally, however, bears use foods intensively in one season and only moderately in another due to shifts in availability, nutritional content, or

preference. These food plants were considered available if they were present and in a prefered phenological stage for at least two weeks of a given season.

Grasses and grass-like plants pose a particular problem to interpreting habitat, and various means of "correcting" for their ubiquitous presence have been offered (Mace 1984, Hadden 1987). We found that our ability to discriminate among c.t.'s on a seasonal basis was improved if we made grasses unavailable in our berry season. Even though grasses remain available and are consumed throughout the foraging season, we assumed that they were not nutritionally significant *vis a vis* the major bear foods (berries) used in the berry season.

A food value (FV_{ik}) for individual food item i and season k was computed using the additive value of two index terms, Exclusivity-of-Use (EX_{ik}) and Nutritive Value (NV_{ik}) (Mattson 1986, Hadden 1987). Scat contents and volumes (corrected for percent digestibility) were used to derive the index of "exclusivity-of-use". Exclusivity is computed by dividing average scat volume (U_{ik}) of food item i in season k by scat frequency of food item i in season k (FQ_{ik}). Greater exclusivity is influenced by two factors: 1. greater selection of one food item over available alternatives, and 2. use of a food item in habitat poor in alternatives choices (Mattson et al. 1986). The index of exclusivity attempts to account for biases usually associated with the interpretation of scat data, including disproportionate sample sizes within and between seasons. Under-sampled food items that comprised most or the total volume of a scat, or that were readily digested, were weighted upward. Over-sampled food items of moderate or low volume, or those that were poorly digested, were weighted downward.

Food item nutritive value (NV_{ik}) was determined for each food item i for each season k. NV was calculated as an additive combination of food item contents, including percent protein, carbohydrates, and fat. Data on nutritive content of food items was taken from published sources (Craighead et al. 1982, Sizemore and Jonkel 1980, Hammer et al. 1983).

Community type importance values ($CTIV_{jk}$) for c.t. j in season k were calculated to indicate foraging potential of c.t.'s for grizzly bears, using a food item

impotance value ($FIIV_{ijk}$) for food item i in season k and community type j,. FIIV was computed by taking the product of canopy cover and the constancy of food items and multiplying by food value (FV_{ik}) and availability (AV_{ik}). CTIV was obtained by summing FIIV within each community type for each season.

Bear Locations

Grizzly bear radio location points were gathered from data reported by Mace and Jonkel (1980). All locations (observations, aerial locations, and close ground locations) were obtained during the summer of 1979. The original field location forms were carefully reviewed and only those locations that appeared to be reliable were used for our analysis. This process yielded 178 point locations from four bears. Of these only 164 fell within the boundary of the final vegetation map. Several potential biases may be associated with the use of this historical data set. Bear activity associated with each location, and changes in vegetation in the seven years since the locations were taken are unknown. Nevertheless, we feel these data have value for developing the methodology used in the present experiment.

Analyzing and Interpreting Grizzly Bear Habitat-Use

Grizzly bear locations were analyzed in two ways: as point locations within discrete plant community types, and as the center of 100 acre scan circles (radius= 375 m) encompassing a mosaic of community types. Program GEOCALC (Hoskin 1985) was used to combine grizzly bear radio location points with the digitized vegetation map, generate random points, generate scan circles around animal and random points, and calculate the area of map polygons (identified to community type) within scan circles.

The following tests were conducted:

* Spearman's rank correlation statistic (Seigel 1956) was used to assess the relationship between frequency of seasonal use (occurence) of individual c.t.'s and seasonal CTIV's; and

* Spearman's rank correlation statistic was used to assess the relationship between frequency of seasonal occurence of c.t.'s in scan areas and seasonal CTIV's;

* Discriminant function analysis was used to test the hypothesis that seasonal habitat requirements were sufficiently different to provide clear separation, assuming, as Lyon (1985) stated, "that animals select those combinations of habitat variables best able to satisfy daily and seasonal needs."

All statistical tests were completed on the University of Montana's VAX 8600 computer using the Statistical Package for the Social Sciences (SPSSX) (SPSS Inc. 1983, Norusis 1985).

RESULTS AND DISCUSSION

Community Type Classification and Map

Fifty-one community types were identified from the analysis of 1449 stands. Community type descriptions, vegetative data summaries, and physical data are lengthy and have been placed in the appendixes (appendix B, C,and D, respectively) in a condensed format.

A digitized community type map of the study area was produced as the basis for our analyses. This map is of central importance to the outcome of our investigation, however, we were unable to combine map segments (because of computer software limitations) to produce a single community type map for inclusion in this report. We include a segment of this c.t. map (Fig. 2) as a representation of the whole.

Grizzly Bear Food Habits, Foraging Seasons, Food Availability, and Food Value

Twenty-nine grizzly bear food plants were determined from our various sources. These foods, their availability, and food value are presented in Table 3. Whitebark pine (*Pinus albicaulis*) is listed in this species list, but its availability was set to zero in both the pre-berry and berry seasons because of its widespread death across the study area.

Foraging seasons were determined by a discriminant function analysis. We discriminated among 5 monthly periods (May-June, July, August, September, October-November) and established 2 foraging seasons: pre-berry (May 1 to July 31), and Berry (August 1 to November 30). These seasons reflect the availability of food items and the physiological requirements of grizzly bears. The pre-berry season is marked by the availability and use of grasses and succulent forbs. The berry season reflects use of fruit producing shrubs.

Community Type Importance Values, and Bear Location Frequency and Occurrence

Table 4 summarizes data computed for each community type in our study area. These data include number of sample plots, seasonal CTIV, frequency of bear location points occuring in the c.t. by season, and the frequency of occurrence and mean acres of c.t.'s within scan circles by season.

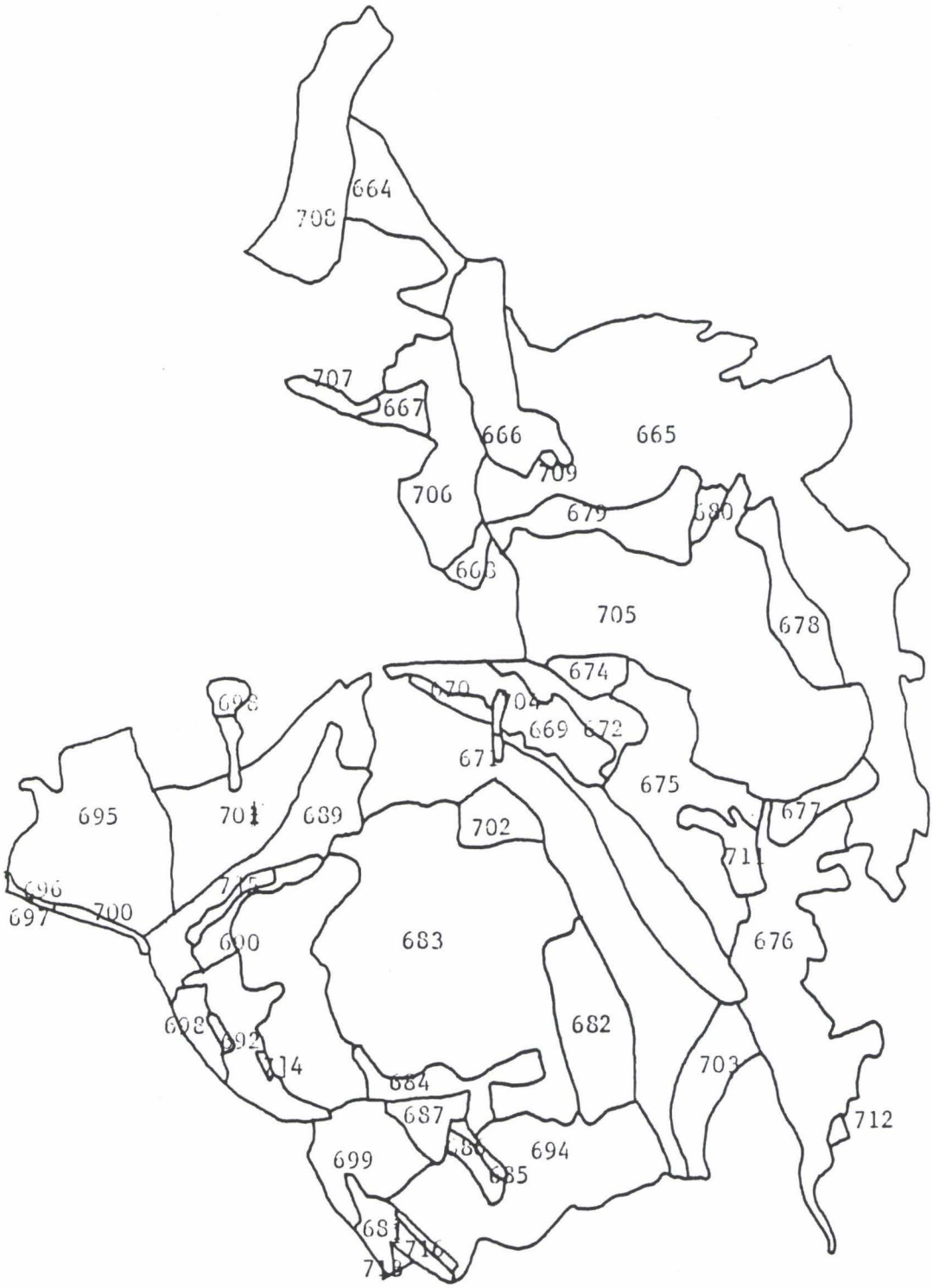

Figure 2. Partial section of the digitized community type map. Numbers correspond to sequentially labeled polygons. Polygons are set equal to community types; no two adjacent polygons are the same community type. Scale is approximately 1:24,000.

Table 3. Seasonal food values and availability of bear plant foods.

		MAY - JUL		AUG - NOV	
LIFE FORM	SPECIES	FOOD VALUE	AVAILABILITY	FOOD VALUE	AVAILABILITY
TREE	PINALB	.90	0.00	.90	0.00
SHRUBS	BERREP	0.00	0.00	.57	1.00
	LONSPP	.54	1.00	0.00	0.00
	SAMRAC	0.00	0.00	.77	1.00
	CORSTO	0.00	0.00	.59	1.00
	SHECAN	.56	1.00	.69	1.00
	VACSPP	0.00	0.00	.91	1.00
	VACSCO	0.00	0.00	.91	1.00
	RIBSPP	.51	1.00	.57	1.00
	PRUVIR	0.00	0.00	.57	1.00
	ROSPPP	0.00	0.00	.54	1.00
	RUBSPP	0.00	0.00	.54	1.00
	SORSCO	0.00	0.00	.50	1.00
FORBS	ANGARC	.64	1.00	0.00	0.00
	HERLAN	.68	1.00	0.00	0.00
	LOMSPP	.71	1.00	0.00	0.00
	OSMSPP	.64	1.00	0.00	0.00
	SENTRI	.61	1.00	0.00	0.00
	TAROFF	.65	1.00	.52	1.00
	HEDBOR	0.00	0.00	.90	1.00
	TRIREP	.57	1.00	.63	1.00
	ERYGRA	.48	1.00	0.00	0.00
	CLALAN	.54	1.00	0.00	0.00
	FRAVIR	.48	1.00	0.00	0.00
	EQUARV	.59	1.00	0.00	0.00
GRAMINOIDS	CAXSPP	.40	1.00	0.00	0.00
	LUZSPP	.40	1.00	0.00	0.00
	GRASSES	.58	1.00	0.00	0.00

@end(verbatim)
]

Table 4. Community type IVs, frequency of bear location, and average acreage within scan circles.

COMMUNITY TYPE	NO. OF PLOTS	MAY-JUL BEAR LOCATIONS				AUG-NOV BEAR LOCATIONS				RANDOM		
		IV	POINT FREQ.	SCAN FREQ.	MEAN ACRES	IV	POINT FREQ.	SCAN FREQ.	MEAN ACRES	POINT FREQ.	SCAN FREQ.	MEAN ACRES
Slabrock	18	.33	0.0	4.0	.81	.13	2.9	5.0	2.10	1.3	3.2	.94
Rockland/Grass	22	.22	0.0	.5	.15	.06	0.0	.6	.05	.5	1.7	.46
Mesic Carex	9	.80	0.0	0.0	0.00	.03	0.0	.4	.02	.3	.1	0.00
Hydro/Mesic Carex	11	.79	0.0	0.0	0.00	.02	0.0	.6	.05	.3	.1	0.00
Mesic/Xeric Gram	90	.55	0.0	2.0	1.00	.05	5.0	2.8	1.28	4.8	5.4	3.70
Salix/Carex	12	1.00	0.0	.3	.02	.02	0.0	.1	.01	.3	.2	.02
Alin/Atfe	5	.49	0.0	0.0	0.00	.02	0.0	.2	.01	.3	.2	.01
Spde/Setr	30	.59	0.0	2.0	.33	.30	0.0	3.8	.87	.5	1.6	.33
Rupa/Thoc	32	.38	1.7	3.5	.74	.61	0.0	.9	.07	1.0	1.5	.26
Rupa/Xete	17	.18	0.0	.7	.07	.38	0.0	1.1	.35	.3	.7	.27
Pamy/Xete	14	.32	0.0	1.3	.14	.24	0.0	.9	.24	.3	.5	.17
Acgl/Rupa	14	.31	1.7	.3	.15	.41	0.0	.5	.10	.3	.4	.09
Acgl/Sosc	27	.10	0.0	2.0	.52	.48	0.0	.8	.22	.3	1.8	.42
Acgl/Xete	20	.19	3.4	3.4	1.45	.48	1.0	.7	.05	.3	.4	.13
Amal/Acmi	26	.36	0.0	1.0	1.11	.16	0.0	.7	.13	.5	1.3	.79
Vagl/Xete	31	.25	0.0	1.3	.21	.68	1.0	2.5	1.51	1.0	1.6	1.06
Vasc/Xete	7	.45	0.0	.2	.03	.65	0.0	.2	.11	.3	.3	.13
Pofr/Gram	4	.15	0.0	0.0	0.00	0.00	0.0	0.0	.00	.3	.2	.02
Alsi/Vigl	44	.28	0.0	2.7	.96	.25	1.0	3.0	.64	.3	2.5	.63
Alsi/Atfi	57	.27	6.8	11.9	8.00	.26	1.9	6.7	2.24	3.3	6.8	3.50
Alsi/Xete	2	0.00	0.0	0.0	0.00	.42	0.0	.1	.01	.3	0.0	0.00
Alsi/Opho	8	.17	0.0	0.0	0.00	.19	1.0	.6	.84	.5	1.2	.46
Alsi/Mefe	10	.27	3.4	2.3	3.70	.36	0.0	.2	.07	.3	.4	.29
Ergr/Luhi	13	.81	0.0	0.0	0.00	.08	0.0	.5	.05	.3	.2	.02
Setr/Arla	66	.98	3.4	2.5	2.44	.06	1.9	2.5	.44	.3	1.9	.43
Setr/Epan	20	.54	1.7	.5	.50	.13	0.0	.5	.35	.3	.6	.16
Psme/Vagl-SAP	24	.14	3.4	1.7	1.33	.54	0.0	.9	.26	.5	1.9	.97
Psme/Vagl/Xete-MAT	39	.20	3.4	2.2	2.11	.42	2.9	1.8	3.05	5.3	4.4	4.97
Psme/Syal-SAP	10	.27	0.0	2.0	1.05	.11	0.0	.1	.05	.3	1.2	.44
Psme/Syal-MAT	6	.34	3.4	1.0	1.36	.11	0.0	.2	.35	2.3	.9	1.86
Abla/Clun/Arnu	1	.04	0.0	.2	.50	.55	1.9	.4	1.13	2.3	1.2	2.56
Rupa/Epan	23	.37	0.0	1.2	.78	.49	0.0	1.3	.82	.3	1.4	1.11
Pamy/Epan	17	.19	0.0	.2	.14	.11	0.0	.4	.20	.3	.6	.61
Acgl/Epan	52	.16	1.7	1.8	.96	.42	1.0	1.4	1.19	3.3	3.0	2.77
Laoc/Pamy	26	.21	0.0	.2	.14	.37	1.0	.7	1.06	2.0	1.1	1.23
Psme/Pamy	22	.05	1.7	1.8	2.26	.57	0.0	1.3	.88	3.3	2.0	2.97
Abla/Vagl-SAP DIS	20	.15	0.0	.5	.39	.56	0.0	.2	.52	.8	1.2	.91
Abla/Vagl-MOS SAP	16	.10	1.7	1.2	1.92	.69	0.0	.2	.23	.8	1.4	.90
Abla/Cl/Vagl-MAT UND	35	.09	10.2	6.2	12.61	.61	3.9	3.3	2.40	5.0	4.9	4.68

(TABLE 4, CONTINUED)

Abla/Mefe-SAP DIS	59	.21	5.1	1.5	4.15	.62	4.0	4.7	8.47	4.5	2.4	3.42
Abla/Mefe-SAP UND	17	.12	0.0	1.7	1.16	.73	10.5	4.0	7.30	.8	1.8	1.14
Abla/Cl/Mefe-MAT UND	64	.09	23.7	11.7	22.68	.63	22.9	12.9	23.32	23.2	11.3	23.69
Abla/Vagl-MAT	27	.08	0.0	5.5	3.59	.97	2.9	3.0	1.70	1.5	1.5	.93
Abla/Vagl-SAP	33	.13	0.0	2.8	1.18	.78	2.9	4.3	3.15	.3	1.4	.77
Vagl/Xete-SEED	28	.28	0.0	.8	.43	.83	1.0	1.2	.88	1.8	2.1	.99
Abla/Vagl-SAP UND	80	.31	1.7	1.7	1.63	.80	4.8	3.9	2.84	4.8	4.1	3.50
Abla/Lu/Vasc-MAT UND	48	.36	3.4	3.2	3.86	1.00	4.8	2.6	3.10	2.8	3.5	3.51
Abla/Mefe-SAP UND	56	.27	3.4	1.7	.66	.56	2.9	4.4	3.37	2.3	3.0	2.05
Abla/Lu/Mefe-MAT UND	113	.25	15.3	6.7	12.32	.75	19.0	10.5	20.83	17.9	8.0	18.09
Abla/Luhi-SAP UND	10	.86	0.0	0.0	0.00	.06	0.0	0.0	0.00	.3	.1	.28
Pial/Vasc	10	.25	0.0	0.0	0.00	.82	0.0	.2	.05	.3	.6	.52

Grizzly Bear Habitat Interpretation

Spearman's correlation between CTIV and bear use

Spearman's' rank correlation statistic was used to test the functional relationship between CTIV's and occurrence of bear use within specific c.t.'s. CTIV's were positively correlated with frequency of bear use of c.t.'s in the berry season (Spearman's Rho = 0.45, $P < 0.01$). However, no relationship was observed between CTIV and frequency of use for the pre-berry season (Spearman's Rho = -0.13, $P > 0.35$). Similar results were obtained for association between's importance value and the frequency of c.t. occurrence within a 100 acre scan circle around bear locations. A positive correlation was observed for the berry season (Spearman's Rho = 0.37, $P < 0.01$), but no relationship was observed in the pre-berry season (Spearman's Rho = -0.10, $P > 0.45$),

The lack of correlation between frequency of c.t. use and CTIV in the pre-berry season may have been influenced by a number of factors. The specific activity of bears at radio locations were unknown; sites may have been selected on the basis of cover and not c.t. foraging potential (CTIV's). Second, our CTIV's do not accurately reflect foraging potential in this season. Third, Grizzly bear behavior is typically dominated by social interactions during this season. The priority for males in this season is the search for mates, while conversely, the priority for females with cubs is finding secure habitat at the expense of habitat productivity. Two of the four bears were adult males, while a third was a female with cubs-of-the-year. Movement and use of habitat may be dictated more by specific behavior pattern than by searching for high quality foraging sites. Our small sample sizes (number of bears and number of locations) prevented us from running correlations for specific classes of bears.

Our findings of correlation between bear use and CTIV's in the second season indicate that CTIV's predict the potential for bear use of c.t.'s more accurately than for the pre-berry season. During this period, grizzly bears are undergoing physiological changes and must maximize caloric intake in preparation for hibernation. This dictates that bears obtain foods high in carbohydrates and fats, and convert from generalist to specific users of plant communities. In our South Fork study area, fruit producing c.t.'s are where bears find these foods.

Discriminant function analysis

Discriminant function was used to distinguish seasonal habitat use based on the extent (area) of c.t.'s within 100 acre scan circles. Our analysis used locations from three of the four bears in our data set, as one bear lacked locations for the pre-berry season. The percent correct classification for *individual* bears was high for both pre-berry and berry seasons (Table 5). The overall correct classification for each was 95, 91, and 93 percent. These results indicate that individual bears use available habitat elements differently, an interpretation that agrees with reported behavior patterns (Mealey 1980). When *all* bear locations were combined, the percent correct classification decreased, with a total correct classification of 83 percent (Table 6).

An examination of the entry order of c.t. (discriminating variable) for both individual and grouped bears indicates that the classification was effectively driven, in the first twelve steps, by the presence of moist grass,forb and shrub c.t.'s (CT23, CT25, CT9, CT3, and CT26, Table 6). Accordingly, the absence of moist types (the occurence of fruit producing shrub communities) in the second season drove the classification to solution (CT27, CT41, CT48, CT17, and CT44, Table 6).

Although the presence or absence of moist types drove the first steps of the classification for all bears combined, fruit producing c.t.'s were occasionally highly important in the cases of individual bears, notably "Abilas/Menfer-Sapling, undisturbed c.t." for bear 297 (Table 5). Fruit producing c.t.'s were generally entered at a later stage in the step-wise discriminant function, nonetheless, they contribute to a biologically sound interpretation of results.

The results from the discriminant function analysis for individual and grouped bears requires separate examination. A considerable amount of home range overlap occurs with grizzly bears, both within and between sexes in the spring-summer period. Female, however, show greater fidelity to specific locales (Mattson, personal communication). Thus individual bears are situated within seasonal home ranges that contain different combinations of c.t.'s. Our results show that individual bears exploit different combinations of c.t.'s during the pre-berry season. The high percentage classification success for individuals indicates that bears are interacting in unique ways with available habitat.

The discriminant function results for grouped bears contrasts with those for individual bears. The percent total correct classification falls off considerably between the two seasons, due mostly to the difficulty of classifying locations in the May-July period. This may be explained by the fact that individual bears use spring-summer habitat in unique ways. This implies that there are many combinations of c.t.'s that can fulfill the requirements of grizzly bears in this period.

In the berry season, we obtained high percentage correct classification for both individual and grouped animals. This would indicate that all bears respond similarly to nutritional and behavioral requirements during this season by using similar combinations of c.t.'s.

These results are encouraging. However, several variables entered in the step-wise discriminant function are, at first glance, difficult to explain. For example, community types "Abilas/Cliuni/Xerten-mature, undisturbed", and "Abilas/Cliuni/Menfer-mature, undisturbed" have little apparent forage value. And yet, for grouped and individual bears, these c.t.'s are important discriminators in the pre-berry season. In the case of the "Abilas/Cliuni/Xerten" c.t., this type has a moderately high CTIV (0.61) for the berry season, but is five times more prevalent in the pre-berry season than in the berry season for bear 363, a male. An explanation may be that this c.t., which frequently has moist grass, forb, and shrub types associated with its edges, is prefered for bedding and loafing, however, our bear radio location points were not differentiated by activity (feeding, resting, or traveling).

Table 5. Summary statistics for discriminant fuction analysis for @i[individual] bears at 10 steps, including summary of mean arces and CTIV for by individual c.t.'s, and c.t.'s grouped by structural class.

BEAR NO. 297:

	ACTION		VARS	WILKS'			SEASON			
							MAY-JUL		AUG-NOV	
STEP	ENTERED	REMOVED	IN	LAMBDA	SIG.	LABEL	MEAN ACRES	CTIIV	MEAN ACRES	CTIIV
1	CT41		1	.76560	.0001	Abla/Mefe-SAP UND	0.272	0.12	17.818	0.73
2	CT23		2	.67690	.0000	Alsi/Mefe	8.138	0.27	0.032	0.36
3	CT39		3	.60623	.0000	Ab/Cl/Vag-MAT UND	2.944	0.09	0.181	0.61
4	CT25		4	.54174	.0000	Setr/Arla	4.476	0.98	0.405	0.06
5	CT32		5	.48955	.0000	Rupa/Epan	1.917	0.37	0.309	0.11
6	CTDIV		6	.42556	.0000	COMMUNITY DIVERSITY	9.917	--	8.382	--
7	CT35		7	.37934	.0000	Laoc/Pamy	0.347	0.21	0.000	0.37
8	CT5		8	.32043	.0000	Mesic/Xeric Gram	0.377	0.55	0.661	0.05
9	CT1		9	.27290	.0000	Slabrock	1.996	0.33	3.059	0.13
10	CT48		10	.25591	.0000	Abla/Mefe-SAP UND	0.996	0.27	3.122	0.56
						MATURE TREE	2.944		0.181	
						MID-SERAL TREE	1.615		21.121	
						SHRUB	10.055		0.341	
						GRASS/FORB	6.849		4.029	

CLASSIFICATION RESULTS -

GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		MAY-JUL	AUG-NOV
MAY-JUL	24	22 91.7%	2 8.3%
AUG-NOV	34	1 2.9%	33 97.1%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 94.83%

(TABLE 5, CONTINUED)

BEAR NO. 363:

STEP	ACTION ENTERED	ACTION REMOVED	VARS IN	WILKS' LAMBDA	SIG.	LABEL	SEASON: MAY -JULY MEAN ACRES	SEASON: MAY -JULY CTIIV	SEASON: AUGUST - NOVEMBER MEAN ACRES	SEASON: AUGUST - NOVEMBER CTIIV
1	CT39		1	.80464	.0027	Ab/Cl/Vag-MAT UND	26.087	0.09	5.296	0.61
2	CT14		2	.69268	.0005	Acgl/Xete	3.204	0.19	0.087	0.48
3	CT23		3	.59611	.0001	Alsi/Mefe	0.895	0.27	0.254	0.36
4	CT15		4	.47870	.0000	Amal/Acmi	1.602	0.36	0.058	0.16
5	CT5		5	.42265	.0000	Mesic/Xeric Gram	2.517	0.55	1.014	0.05
6	CT45		6	.39552	.0000	Vagl/Xete-SEED	0.000	0.28	0.014	0.83
7	CT47		7	.37196	.0000	Ab/Lu/Vas-MAT UND	3.465	0.36	1.838	1.00
8	CT9		8	.35726	.0000	Rupa/Thoc	1.030	0.38	0.058	0.61
9	CT26		9	.34440	.0000	Setr/Epan	1.564	0.54	1.391	0.31
10	CT43		10	.31365	.0000	Abla/Vagl-MAT	5.702	0.08	4.940	0.97
						MATURE TREE	35.254		12.074	
						MID-SERAL TREE	0.000		0.014	
						SHRUB	6.731		0.457	
						GRASS/FORB	4.081		2.405	

CLASSIFICATION RESULTS -

GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP: MAY-JUL	PREDICTED GROUP MEMBERSHIP: AUG-NOV
MAY-JUL	19	17 89.5%	2 10.5%
AUG-NOV	25	2 8.0%	23 92.0%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 90.91%

(TABLE 5, CONTINUED)

BEAR NO.395:

ACTION STEP	ENTERED	REMOVED	VARS IN	WILKS' LAMBDA	SIG.	LABEL	SEASON: MAY -JULY MEAN ACRES	MAY -JULY CTIIV	AUGUST - NOVEMBER MEAN ACRES	AUGUST - NOVEMBER CTIIV
1	CT43		1	.86762	.0140	Abla/Vagl-MAT	4.089	0.09	0.715	0.61
2	CT25		2	.77885	.0053	Setr/Arla	0.960	0.98	0.316	0.06
3	CT46		3	.69209	.0016	Abla/Vagl-SAP UND	0.440	0.31	4.827	0.80
4	CT44		4	.59972	.0003	Abla/Vagl-SAP	0.026	0.13	5.856	0.78
5	CT9		5	.54717	.0002	Rupa/Thoc	0.362	0.38	0.000	0.61
6	CT5		6	.50627	.0001	Mesic/Xeric Gram	0.109	0.55	2.320	0.05
7	CT30		7	.43668	.0000	Psme/Syal-MAT	1.890	0.34	0.888	0.11
8	CTDIV		8	.39634	.0000	COMMUNITY DIVERSITY	9.714	--	9.742	--
9	CT38		9	.36079	.0000	Abla/Vagl-MOS SAP	6.004	0.10	0.316	0.69
10	CT29		10	.29289	.0000	Psme/Syal-SAP	1.216	0.27	0.000	0.11
						MATURE TREE	5.979		1.603	
						MID-SERAL TREE	7.686		10.999	
						SHRUB	0.362		0.000	
						GRASS/FORB	1.064		2.636	

CLASSIFICATION RESULTS -

GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP: MAY-JUL	AUG-NOV
MAY-JUL	14	11 78.6%	3 21.4%
AUG-NOV	31	0 0.0%	31 100.0%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 93.33%

Table 6. Summary statistics for discriminant fuction analysis for @i[grouped] bear at 20 steps, including summary of mean arces and CTIV for by individual c.t.'s, and c.t.'s grouped by structural class.

	ACTION		VARS	WILKS'			SEASON			
							MAY-JUL		AUG=NOV	
STEP	ENTERED	REMOVED	IN	LAMBDA	SIG.	LABEL	MEAN ACRES	CTIIV	MEAN ACRES	CTIIV
1	CT39		1	.90159	.0000	Ab/Cl/Vag-MAT UND	12.613	0.09	2.396	0.61
2	CT23		2	.81205	.0000	Alsi/Mefe	3.704	0.27	0.071	0.36
3	CT25		3	.75900	.0000	Setr/Arla	2.436	0.98	0.445	0.06
4	CT15		4	.70425	.0000	Amal/Acmi	1.118	0.36	0.128	0.16
5	CT14		5	.65574	.0000	Acgl/Xete	1.449	0.19	0.059	0.48
6	CT38		6	.63335	.0000	Abla/Vagl-MOS SAP	1.922	0.10	0.231	0.69
7	CT42		7	.60943	.0000	Ab/Cl/Mef-MAT UND	22.677	0.09	23.322	0.63
8	CT9		8	.58936	.0000	Rupa/Thoc	0.737	0.38	0.072	0.61
9	CT27		9	.57212	.0000	Psme/Vagl-SAP	1.333	0.14	0.259	0.54
10	CT2		10	.56432	.0000	Rockland/Grass	0.148	0.22	0.051	0.06
11	CT3		11	.55854	.0000	Mesic Carex	0.000	0.80	0.017	0.03
12	CT26		12	.55290	.0000	Setr/Epan	0.504	0.54	0.389	0.13
13	CT44		13	.54826	.0000	Abla/Vagl-SAP	1.118	0.15	3.153	0.56
14	CT22		14	.54354	.0000	Alsi/Opho	0.000	0.17	0.854	0.19
15	CT41		15	.53920	.0000	Abla/Mefe-SAP UND	1.161	0.12	7.295	0.73
16	CT48		16	.53547	.0000	Abla/Vagl-SAP UND	0.656	0.27	3.374	0.56
17		CT44	15	.53870	.0000	Abla/Vagl-SAP	---	--	---	--
18	CT17		16	.53502	.0000	Vasc/Xete	0.029	0.45	0.114	0.65
19	CTDIV		17	.53901	.0000	COMMUNITY DIVERSITY	11.245	--	9.324	--
20	CT44		18	.52639	.0000	Abla/Vagl-SAP	1.112	0.13	3.153	0.78
						MATURE TREE	35.290		25.718	
						MID-SERAL TREE	7.308		17.465	
						SHRUB	7.037		0.444	
						GRASS/FORB	3.088		0.902	

CLASSIFICATION RESULTS -

GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		MAY-JUL	AUG-NOV
MAY-JUL	59	40	19
		67.8%	32.2%
AUG-NOV	105	10	95
		9.5%	90.5%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 82.32%

SUMMARY

Our results may be summarized as follows:

* No relationship was observed between the frequency of occurence of c.t.'s and CTIV's, either individually or in 100 acre scan circles in the pre-berry season. Other behavioral factors, such as the search for mates or security, may explain these results. Alternately, newer radio location data, (categorized by activity, precisely located, and augmented with feeding site information), may provide additional insight into these relationships.

* A significant and positive correlation was observed between the frequency of occurence of c.t.'s and CTIV's, both individually and in 100 acre scan circles in the berry season. Grizzly bears are maximizing their caloric intake and are choosing c.t.'s that rank high in food value, where food value for c.t.'s is estimated by a criteria of food abundance, constancy, nutritive value, and availability (CTIV). CTIV is a good indicator of grizzly bear habitat potential for this season.

* Seasonal habitat requirements for grizzly bears were sufficiently different to provide clear separation. These differences were particularly strong for individual bears, and less so for all bears combined in discriminant function analysis. These results suggest that, in the pre-berry season, individual bears use different combinations of c.t.'s and are interacting in unique ways with available habitat. In the berry season, all bears respond similarly to nutritional and behavioral requirements, by selecting similar combinations of c.t.'s, principally fruit producing c.t.'s.

* Plant community types provide an adequate basis upon which to evaluate grizzly bear habitat. The potential exists for improving the performance of this evaluation with precise radio locations, feeding site data, and more complete food habits and plant phenological data.

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Genus and Species	Common Name	Symbol
TREES		
Abies lasiocarpa	Subalpine fir	ABILAS
Betula paperifera	Paper birch	BETPAP
Larix occidentalis	Western larch	LAROCC
Picea engelmannii	Engelmann spruce	PICENG
Pinus albicaulis	White bark pine	PINALB
Pinus contorta	Lodgepole pine	PINCON
Pinus monticola	Western white pine	PINMON
Pinus ponderosa	Ponderosa pine	PINPON
Populus tremuloides	Trembling aspen	POPTRE
Populus trichocarpa	Black cottonwood	POPTRI
Pseudotsuga menziesii	Douglas-fir	PSEMEN
Taxus brevifolia	Western yew	TAXBRE
Thuja plicata	Western red cedar	THUPLI
SHRUBS		
Acer glabrum	Mountain maple	ACEGLA
Alnus incana	Alder	ALNINC
Alnus sinuata	Sitka alder	ALNSIN
Amelanchier alnifolia	Serviceberry	AMEALN
Arctostaphylos uva-ursi	Kinnikinnik	ARCUVA
Artemesia spp.	Sagebrush	ARTEME
Berberis repens	Oregon grape	BERREP
Ceanothus velutinus	Silky ceanothus	CEAVEL
Clematis columbiana	Virginsbower	CLECOL
Cornus stolonifera	Red-osier dogwood	CORSTO
Crataegus douglasii	Hawthorn	CRADOU
Habenaria dilitata	White bog orchid	HABDIL
Habenaria saccata	Slender bog orchid	HABSAC
Holodiscus discolor	Ocean spray	HOLDIS
Juniperus communis	Common juniper	JUNCOM
Juniperus horizontalis	Creeping juniper	JUNHOR
Kalmia polifolia	Laurel	KALPOL
Ledum glandulosa	Labrador tea	LEDGLA
Linneae borealis	Twinflower	LINBOR
Lonicera involucrata	Twinberry	LONINV
Lonicera utahensis	Utah honeysuckle	LONUTA
Menziesia ferugenia	Fools huckleberry	MENFER
Oplopanax horridum	Devil's club	OPLHOR
Pachistima myrsinites	Pachistima	PACMYR
Philadelphus lewisii	Mockorange	PHILEW
Physocarpus malvaceus	Nine bark	PHYMAL
Potentilla fruticosa	Shrubby cinquefoil	POTFRU
Prunus virginiana	Chokecherry	PRUVIR
Rhamnus alnifolia	Alder buckthorn	RHAALN
Ribes lacustre	Prickly currant	RIBLAC
Ribes spp.	Ribes	RIBESX
Ribes viscosissimum	Sticky current	RIBVIS
Rosa acicularis	Rose	ROSACI
Rosa spp.	Rose	ROSEXX
Rubus idaeus	Red raspberry	RUBIDA
Rubus parviflora	Thimbleberry	RUBPAR
Salix spp.	Willow	SALIXX

Sambucus racemosa	Elderberry	SAMRAC
Shepherdia canadensis	Buffaloberry	SHECAN
Sorbus scopulina	Mountain ash	SORSCO
Sorbus sitchensis	Sitka mountain ash	SORSIT
Spirea betulifolia	White spirea	SPIBET
Spiraea densifolia	Red spirea	SPIDEN
Symphoricarpos albus	Snowberry	SYMALB
Vaccinium globulare	Globe huckleberry	VACGLO
Vaccinium scoparium	Grouse whortleberry	VACSCO

FORBS AND FERNS

Achillea millefolium	Yarrow	ACHMIL
Actaea rubra	Baneberry	ACTRUB
Adenocaulon bicolor	Pathfinder	ADEBIC
Adiantum pedatum	American maidenhair	ADIPED
Agastache urticifolia	Nettle-leaf horse-mint	AGAURT
Allium cernuum	Nodding onion	ALLCER
Allium schoenoprasum	Chives	ALLSCH
Allium spp.	Wild onion	ALLIUM
Anaphalis margaritacea	Pearly everlasting	ANAMAR
Anemone multifida	Cliff anemone	ANEMUL
Angelica arguta	Angelica	ANGARG
Antennaria microphylla	Pussytoes	ANTMIC
Antennaria racemosa	Pussytoes	ANTRAC
Apocynum androsaemifolium	Dogbane	APOAND
Aquilegia flavescens	yellow columbine	AQUFLA
Arabis nuttallii	Nuttall rockcress	ARANUT
Aralia nudicaulis	Wild sasparilla	ARANUD
Arenaria capillaris	Arenaria	ARECAP
Arnica cordifolia	Heart-leaf arnica	ARNCOR
Arnica diversifolia	Sticky arnica	ARNDIV
Arnica latifolia	Mountain arnica	ARNLAT
Artemisia ludoviciana	Prairie sagewort	ARTLUD
Artemisia michauxiana	Michaux sagewort	ARTMIC
Aster conspicuus	Aster	ASTCON
Aster engelmannii	Aster	ASTENG
Aster spp.	Aster	ASTERX
Astragalus spp.	Milkvetch	ASTRAG
Athyrium filix-femina	Lady fern	ATHFIL
Balsamorhiza sagittata	Arrowleaf balsamroot	BALSAG
Calochortus apiculatus	Mariposa lily	CALAPI
Campanula rotundifolia	Harebell	CAMROT
Campanula spp.	Bell flower	CAMPAN
Castilleja spp.	Indian paintbrush	CASTIL
Cerastium arvense	Field chickweed	CERARV
Cheilanthes gracllima	Lace lipfern	CHEGRA
Chimaphila umbellata	Prince's pine	CHIUMB
Circaea alpina	Alpine circaea	CIRALP
Cirsium spp.	Thistle	CIRSIU
Claytonia lanceolata	Western springbeauty	CLALAN
Clintonia uniflora	Queencup beedlily	CLIUNI
Collinsia parviflora	Sml-flwrd blue-eyed mary	COLPAR
Cornus canadensis	Bunchberry	CORCAN
Cryptogramma crispa	Rockblade	CRYCRI
Delphinium spp.	Larkspur	DELPHI
Disporum hookeri	Hooker's fairybell	DISHOO

Dodecatheon pauciflorum	Shooting star	DODPAU
Epilobium angustifolium	Fireweed	EPIANG
Equisetum arvense	Horsetail	EQUARV
Equisetum spp.	Horsetail	EQUISE
Erigeron compositus	Cut-leaved daisy	ERICOM
Erigeron peregrinus	Peregrine fleabane	ERIPER
Erigeron spp.	Daisy	ERIGER
Eriogonum flavum	Yellow buckwheat	ERIFLA
Eriogonum spp.	Buckwheat	ERIOGO
Eriogonum umbellatum	Sulfur eriogonum	ERIUMB
Erythronium grandiflorum	Glacier lily	ERYGRA
Fragaria vesca	Woods strawberry	FRAVES
Fragaria virginiana	Wild strawberry	FRAVIR
Galium boreale	Northern bedstraw	GALBOR
Galium triflorum	Sweet-scented bedstraw	GALTRI
Gentiana calycosa	Pleated gentian	GENCAL
Geum macrophyllum	Large leaved avens	GEUMAC
Geum triflorum	Old man's whiskers	GEUTRI
Goodyera oblongifolia	Rattlesnake plantain	GOOOBL
Gymnocarpium dryopteris	Oak fern	GYMDRY
Hedysarum spp.	Hedysarum	HEDYSA
Hedysarum sulphurescens	Hedysarum	HEDSUL
Heracleum lanatum	Cow parsnip	HERLAN
Heuchera cylindrica	Alumroot	HEUCYL
Hieracium albiflorum	White hawkweed	HIEALB
Hieracium cynoglossoides	Houndstongue hawkweed	HIECYN
Hieracium gracile	Slender hawkweed	HIEGRA
Hydrophyllum capitatum	Ballhead waterleaf	HYDCAP
Hypericum formosum	Western St. John's-wort	HYPFOR
Hypericum scouleri	Western St. John's-wort	HYPSCO
Iliamna rivularis	Globemallow	ILIRIV
Ligusticum spp.	Licorice root	LIGUST
Lithophragma parviflorum	Smallflower fringecup	LITPAR
Lomatium cous	Cous biscuit-root	LOMCOU
Lomatium dissectum	Fern-leaved lomatium	LOMDIS
Lomatium triternatum	Nine leaf lomatium	LOMTRI
Lomatium spp.	Biscuit-root	LOMATI
Lupinus spp.	Lupine	LUPINU
Lycopodium annotinum	Stiff clubmoss	LYCANN
Menyanthes trifoliata	Buckbean	MENTRI
Mertensia longiflora	Small bluebells	MERLON
Mimulus lewisii	Lewis monkey flower	MIMLEW
Mitella breweri	Brewer's mitrewort	MITBRE
Myosotis laxa	Forget-me-not	MYOLAX
Nuphar polysepalum	Spatter-dock	NUPPOL
Osmorhiza chilensis	Mountain sweet-cicely	OSMCHI
Osmorhiza occidentalis	Western sweet-cicely	OSMOCC
Osmorhiza purpurea	Purple sweet-root	OSMPUR
Parnassia fimbriata	Grass-of-parnassus	PARFIM
Pedicularis bracteosa	Bracted lousewort	PEDBRA
Pedicularis contorta	Twisted lousewort	PEDCON
Pedicularis racemosa	Leafy lousewort	PEDRAC
Penstemon confertus	Yellow penstemon	PENCON
Penstemon lyallii	Lyall's beardstongue	PENLYA
Penstemon spp.	Penstemon	PENSTE
Penstemon wilcoxii	Wilcox's penstemon	PENWIL
Phacelia leucophylla	Silverleaf phacelia	PHALEU
Polypodium hesperium	Western polypody fern	POLHES

Polystichum lonchitis	Mountain holly fern	POLLON
Potentilla glandulosa	Sticky cinquefoil	POTGLA
Potentilla spp.	Cinqufoil	POTENT
Prunella vulgaris	Self-heal	PRUVUL
Pteridium aquilinum	Bracken fern	PTEAQU
Pulsatilla occidentalis	Western pasqueflower	PULOCC
Pyrola asarifolia	Pink wintergreen	PYRASA
Pyrola secunda	One-sided wintergreen	PYRSEC
Ranunculus eschscholtzii	Eschscholtz buttercup	RANESC
Ranunculus spp.	Buttercup	RANUNC
Saxifraga bronchialis	Yellowdot saxifrage	SAXBRO
Sedum stenopedalum	Lance-leafed stonecrop	SEDSTE
Senecio megacephalus	Large-headed butterweed	SENMEG
Senecio triangularis	Arrowleaf groundsel	SENTRI
Sibbaldia procumbens	Creeping sibbaldia	SIBPRO
Smilacina racemosa	Western solomon's seal	SMIRAC
Smilacina stellata	False solomon's seal	SMISTE
Solidago canadensis	Canada goldenrod	SOLCAN
Streptopus amplexifolius	Twisted stalk	STRAMP
Taraxacum officianale	Dandelion	TAROFF
Tellima grandiflora	Woodland star	TELGRA
Thalictrum occidentale	Western meadowrue	THAOCC
Tiarella trifoliata	Trefoil foamflower	TIATRI
Tragopogon dubius	Salsify	TRADUB
Trifolium agrarium	Yellow clover	TRIAGR
Trifolium repens	White clover	TRIREP
Trillium ovatum	White trillium	TRIOVA
Trollius laxa	Globeflower	TROLAX
Urtica dioica	Stinging nettle	URTDIO
Valeriana sitchensis	Sitka valeriana	VALSIT
Veratrum viride	False hellebore	VERVIR
Veronica wormskjoldii	Wormskjold speedwell	VERWOR
Viola glabella	Pioneer violet	VIOGLA
Viola orbiculata	Heart-leafed violet	VIOORB
Woodsia oregana	Oregon woodsia	WOOORE
Xerophyllum tenax	Beargrass	XERTEN
Zygadenus elegans	Glaucous zygadenus	ZYGELE

GRASSES & SEDGES

Agropyron spicatum	Bluebunch wheatgrass	AGRSPI
Agropyron spp.	Wheatgrass	AGROPY
Bromus carinatus	Mountain brome	BROCAR
Bromus spp.	Brome	BROMUS
Bromus vilgarus	Columbia brome	BROVUL
Calamagrostis canadensis	Bluejoint	CALCAN
Calamagrostis purpurascens	Purple reedgrass	CALPUR
Calamagrostis rubescens	Pinegrass	CALRUB
Carex aquatilis	Water sedge	CARAQU
Carex atrata	Blackened sedge	CARATR
Carex canescens	Sedge	CARCAN
Carex concinnoides	Northwestern sedge	CARCON
Carex deweyana	Dewey sedge	CARDEW
Carex geyeri	Elk sedge	CARGEY
Carex illota	Sheep sedge	CARILL
Carex lenticularis	Sedge	CARLEN
Carex microptera	Smallwing sedge	CARMIC

Carex microseris	Sedge	CARMIC
Carex nigricans	Black alpine sedge	CARNIG
Carex phaeocephala	Dunhead sedge	CARPHA
Carex rostrata	Beaked sedge	CARROS
Carex scopulorum	Cliff sedge	CARSCO
Carex spectabilis	Showey sedge	CARSPE
Carex spp.	Sedges	CAREXX
Carex vesicaria	Blister sedge	CARVES
Dactylis glomerata	Orchard grass	DACGLO
Danthonia atropurpurea	Danthonia	DANATR
Elymus glaucus	Wildrye	ELYGLA
Festuca idahoensis	Idaho fescue	FESIDA
Festuca viridula	Green fescue	FESVIR
Glyceria grandis	American mannagrass	GLYGRA
Juncus drummondii	Drummond rush	JUNDRU
Juncus mertensianus	Merten's rush	JUNMER
Juncus parryi	Parry's rush	JUNPAR
Juncus spp.	Rush	JUNCUS
Luzula hitchcockii	Woodrush	LUZHIT
Luzula parviflora	Smallflowered woodrush	LUZPAR
Oryzopsis exigua	Little ricegrass	ORYEXI
Phalaris arundinacea	Reed canarygrass	PHAARU
Scirpus spp.	Bullrush	SCIRPU
Trisetum canescens	Tall trisetum	TRICAN
Trisetum spicatum	Spike trisetum	TRISPI

Appendix B

Community Type Descriptions

Community Type Descriptions

This sections contains descriptions of the 51 c.t.'s identified in the South Fork of the Flathead River study area. Community types are hierarchically defined within a vegetation type and successional framework. In the descriptions that follow, c.t. name (in English and latin) is given first, then the vegetation type, followed by the successional stage(s) in which the type occurs, and the disturbance(s) (or treatment) that influenced the development of the c.t. Means and standard deviations of the most important site variables are also listed. The narrative describes species associated with the type, and other special features that aid in distinguishing the type. Supporting data are presented in Appendixes C, D, AND E.

The following terminology has been adopted from Pfister et al. (1977) to describe levels of abundance of plant taxa in c.t.'s: present: 0-1%; common: $\geq$1%; well represented: $\geq$5%; abundant: $\geq$ 25%; absent: not present; scarce: < 1%; poorly represented: < 5%. In additions, the following terms are used to denote levels of constancy of taxa in c.t.'s: ubiquitous: 100%; usually: $\geq$75%; occasionally: < 75; infrequently: < 10%. Site histories (disturbance) are abbreviated as follows: c.c.: clearcut, doz.: dozer piling, fire: wildfire, burn: broadcast and dozer pile burns, and scar.: mechanical scarification.

Note: The classification of these c.t.'s is considered by us to be preliminary. Insufficient time and resources were available to do a thorough evaluation of all 1449 sample plots. For this reason, we felt it would be inappropriate to write a key to these c.t.'s until the classification is complete. We feel, however, that the classification as it stands is sufficiently complete and accurate to fulfil the objectives of the study. Appendix D contains tables of c.t. similarity.

1. Community type name: Slabrock
   Vegetation type: Rockland

Successional class: (n/a)
Disturbance: (n/a)
N= 18

Elevation: 1971 m, (108.5)
Aspect: 98.4°, (stdv.= 70.4)
Slope: 433.1%, (stdv.= 15.1)

Description: This is an upper subalpine type, occuring on moderate to steep slopes where bedrock protrudes through surrounding shallow soils. Among sample stands, exposed rock averaged 45.6 percent (stdv.= 18.0); bare soil was common. Vegetation grows in narrow fissures, intertices, and depressions of the rock surface, and is not highly consistent. Subalpine fir (Abies lasiocarpa) and/or white bark pine (Pinus albicaulis) are generally common. Globe huckleberry (Vaccinium globulare), whortleberry (V. scoparium), and subalpine spiraea (Spiraea densiflora) are variably present. Small flowered rush (Juncus parviflora), elk sedge (Carex geyeri), and/or smooth woodrush (Luzula

hitchcockii) are common. Important forbs include glacier lily (Erythronium grandiflorum) and bear grass (Xerophyllum tenax). The spring ephemeral, glacier lily, is probably underestimated in the data. Dry site forbs include mountain sandwort (Arenaria capillaris), paintbrush (Castilleja spp.), yellow buckwheat (Eriogonum flavum), yarrow (Achillea millefolium), and worm leaf stonecrop (Sedum stenopedalum). Subalpine fir, whitebark pine, and forbland communities are typical adjacent types.

2. Community type name: Rockland - grass
   Vegetation type: Rockland

Successional class: (n/a)
Disturbance: (n/a)
N= 21

Elevation: 1916 m, (stdv.= 185.7)
Aspect: 153.0°, (stdv.= 744.9)
Slope: 63.8%, (stdv.= 21.6)

Description: This type occurs on very steep terrain associated with headwalls and open ridges. Exposed rock averaged 48.8 percent (stdv.= 18.4) and soil averaged 6.77 percent (stdv.= 7.1) among sample stands. Vegetation is highly variable consisting primarily of dry-site shrubs, forb and grasses. Mountain juniper (Juniperus communis), serviceberry (Amelanchier alnifolia), Lyall's penstemon (Penstemon lyallii), yarrow, yellow buckwheat, pearly-everlasting (Anaphalis margaritacea), roundleaf avens (Heuchera cylindrica), beargrass, and elk sedge are usually present to common.

3. Community type name: Mesic sedge (Carex) meadow
   Vegetation type: Grassland

Successional class: (n/a)
Disturbance: (n/a)
N= 9

Elevation: 2089.4 m, (stdv.= 185.7)
Aspect: 239.9°, (stdv.= 308.6)
Slope: 16.1%, (stdv.= 12.9)

Description: This is a moist sedge (species undifferentiated) c.t. encompassing much diversity. It occurs primarily on upper slopes and ridges. Slope angle and aspect vary considerably, however, most stands occured on moderate slopes where accumulated snow persists into late spring or early summer. Moist site sedges, grasses and rushes variably provide the dominant cover. Common moist site forbs includes glacier lily, subalpine daisy (Erigeron peregrinus), arrowleaf groundsel (Senecio triangularis), mountain arnica (Arnica latifolia), and Sitka valerian (Valeriana sitchensis). White pasqueflower (Pulsatilla occidentalis) is also occasionally present. Shrub cover is negligible, with whortleberry occasionally common. Subalpine fir and whitebark pine are scattered and stunted.

4. Community type name: Hydro-mesic sedge meadow
   Vegetation type: Grassland

Successional class: (n/a)
Disturbance: (n/a)
N= 11

Elevation: 1897 m, (155.9)
Aspect: 191.5°, (stdv.= 143.7)
Slope: 3.6%, (stdv.= 7.4)

Description: This type usually occurs in association with permanent and ephemeral bodies of water (lake, pool, stream, and seep) at mid and upper-slopes. A tree overstory is scarce or lacking, and when present is comprised of seedlings and saplings of Subalpine fir and Engelmann spruce (Picea engelmannii). Mature trees are occasionally present. Shrub cover is generally low with menziesia (Menziesia ferruginea), globe huckleberry, and/or willow (Salix spp.) invading otherwise uniform stands of hydrophilic sedges, rushes, and grasses (all undifferentiated). Wet and moist site forbs include horsetail (Equisetum arvense), false hellebore (Veratrum viride), and arrowleaf groundsel.

5. Community type name: **Mesic-xeric grass**
   Vegetation type:Grassland

Successional class: (n/a)
Disturbance: (n/a)
N= 90

Elevation: 1813.8 m, (stdv.= 181.1)
Aspect: 204.2°, (stdv.= 62.8)
Slope: 61.8%, (stdv.= 22.4)

Description: This community type encompasses a broad diversity of plant associations that typically grow on adjacent types and are difficult to distinguish and map except at a large scale. The mesic-xeric grass c.t. occurs from mid- to upper-slopes that have a predominantly southern aspect. Slope angle is steep and bare soil a dominant feature of the type. Grasses, sedges, and rushes are the dominant vegetative cover, and include: fescues (Festuca spp.), wheatgrasses (Agropyron spp.), purple reedgrass (Calamagrostis purpurascens), small flowered rush, and elk sedge. Important forb species are worm leaf stonecrop, Lyall's penstemon, raceme pussytoes (Antennaria racemosa), mountain sandwort, and fern-leaved biscuit-root (Lomatium dissectum).

6. Community type name: **Willow/sedge meadow**
   (Salix spp./Carex spp.)
   Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: (n/a)
N= 12

Elevation: 1891.2 m, (stdv.= 87.1)
Aspect: 45.0°, (stdv.= 59.4)
Slope: 3.8%, (stdv.= 6.4)

Description: This is a wet site c.t. successional to small ponds that have silted in. Standing water is usually present. Willow species, sedges, rushes and grasses (all undifferentiated) are ubiquitous, being well-represented to abundant. Arrow leaf groundsel, false Hellebore, and grass-of-Parnassus (Parnassia fimbriata) are generally present to well represented. Horsetail, and subalpine daisy are also occasionally present. Young to mature subalpine fir and Engelmann spruce are usually present and much scattered through the type.

7. Community type name: **Mountain alder/Lady fern**
   (Alnus incana/Athyrium filix-femina)
   Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: (n/a)
N= 5

Elevation: 1176.8 m, (stdv.= 30.0)
Aspect: 171.0°, (stdv.= 137.6)
Slope: 24.0%, (stdv.= 15.2)

Description: This c.t. occurs on wet sites and is clearly dominated by mountain alder (not shown in cover/constancy table, see note in Appendix C). Mountain maple (Acer glabrum), thimbleberry (Rubus parviflora), and snowberry (Symphoricarpos albus) are also occasionally common to well-represented. Grasses (Calamagrostis spp. and others) are present to abundant. Important forbs include lady fern, horsetail, bedstraw (Galium triflorum), false Hellebore, stinging nettle (Urtica dioica) and others. This type was found in clearcuts but may not be directly related to logging activity, as it occurs along drainage seeps at the lowest elevations in the study area.

8. Community type name: **Subalpine spiraea/Arrowleaf groundsel**
(Spiraea densiflora/Senecio triangularis)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: (n/a)
N= 29

Elevation: 1821.8 m, (stdv.= 100.77)
Aspect: 158.6°, (stdv.= 79.8)
Slope: 49.5%, (stdv.= 20.6)

Description: This is a moist site community usually associated with sitka alder c.t.'s and arrowleaf groundsel c.t.'s. This type occurs in avalanche chutes and in forest openings where topography holds snow into late spring, or where moisture (from seeps) occurs throughout the year. Subalpine spiraea is well represented to abundant. Other common to well represented shrubs include elderberry (Sambucus racemosa), mountain ash (Sorbus spp.), sitka alder, prickly current (Ribes lacustre), and menziesia. Grasses and sedges are ubiquitous, but occur with low coverage. Important forbs include arrowleaf groundsel, stream violet (Viola glabella), meadowrue (Thalictrum occidentale), and fireweed (Epilobium angustifolium). Seedlings and saplings of subalpine fir and Engelmann spruce are generally present.

9. Community type name: **Thimbleberry/meadowrue**
(Rubus parviflora/Thalictrum occidentale)
Vegetation type:Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 31

Elevation: 1670.4 m, (stdv.= 168.1)
Aspect: 189.8°, (stdv.= 68.4)
Slope: 56.0%, (stdv.= 21.6)

Description: This type is almost exclusively found in avalanche chutes, occuring in moist, concave sites toward the middle of the chute. Thimbleberry is well represented to abundant, and mountain ash and elderberry are frequently common. Grasses and sedges are ubiquitous. Fireweed arrowleaf groundsel, and false Hellebore, and stream violet are important forb species. Trees, usually occuring

as seedlings and saplings, are common to absent. Adjoining types include Sitka alder and mountain maple communities.

10. Community type name: **Thimbleberry/beargrass**
(R. parviflora/Xerophyllum tenax)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire
N= 17

Elevation: 1688.9 m, (stdv.= 296.0)
Aspect: 193.0°, (stdv.= 219.1)
Slope: 59.6%, (stdv.= 29.6)

Description: This type occurs primarily in avalanche chutes, but also in old burns where successional trends (i.e. to mature forest) cannot be confidently predicted. This type is considerably warmer and drier that the thimbleberry/meadowrue c.t. described above. Subalpine fir, Engelmann spruce, and other tree species are present to common. Thimbleberry and pachistima (Pachistima myrsinites) are common to well represented. Other important shrubs include mountain ash, mountain maple, and globe huckleberry. Grasses and sedges (primarily elk sedge) are ubiquitous and common. Beargrass, fireweed, meadowrue, and pearly everlasting are the principal forb species.

11. Community type name: **Pachistima/beargrass**
(Pachistima myrsinites/X. tenax)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire
N= 14

Elevation: 1916.0 m, (stdv.= 125.9)
Aspect: 228.9°, (stdv.= 229.9)
Slope: 57.4%, (stdv.= 25.3)

Description: This type is found in the mid- and upper-slopes of avalanche chutes, and sites near ridges burned by wildfire where a successional trend to forest cannot be confidently predicted. Areas of bare soil and exposed rock are often extensive (to 50%), but are not diagnostic of the type. Subalpine fir and white bark pine are common, but only an occasional tree reaches maturity. Important shrubs include pachistima, globe huckleberry, mountain ash, and serviceberry. Elk sedge is ubiquitous and usually well represented. Beargrass is the principal forb species. Fireweed is usually common to well represented. Other forbs vary.

12. Community type name: **Mountain maple/thimbleberry**
(Acer glabrum/Rubus parviflora)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 15

Elevation: 1540.3 m, (stdv.= 198.5)
Aspect: 195.5°, (stdv.= 73.2)
Slope: 44.6%, (stdv.= 18.6)

Description: This type is the most moist of three closely related mountain maple types defined by a moisture gradient. Among sample stands, this c.t. occurred exclusively in avalanche chutes. It was

additionally confined to concave to slightly undulating terrain, although occuring from lower to upper slopes. This type is clearly shrub dominated, with trees only occasionally present. Mountain maple, mountain ash, sitka alder, and thimbleberry produce a dense two story shrub canopy. Elderberry, globe huckleberry, and other shrubs are occasionally common to well represented. Moist site grasses and sedges are ubiquitous. Important forbs include lady fern and fireweed. Forbs which distinguish this c.t. from the other mountain maple communities include false Hellebore, cow parsnip (Heracleum lanatum), stream violet, and stinging nettle, which are variably present to well represented.

13. Community type name: Mountain maple/Mountain ash
(A. glabrum/Sorbus scopulina)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 28

Elevation: 1588.1 m, (stdv.= 157.2)
Aspect: 192.9°, (stdv.= 47.6)
Slope: 58.9%, (stdv.= 15.4)

Description: This c.t. is intermediate in moisture among the three closely related mountain maple types, defined along a moisture gradient. All sample stands of this type occured within avalanche chutes, and on concave to to convex sites. Tree cover is negligible. Important shrubs include mountain maple, Sitka alder, mountain ash, and thimbleberry. Pachistima is a distinguishing shrub between this c.t. and the mountain maple/thimbleberry c.t. (above). Grasses and sedges are generally common. Important forbs include meadowrue, beargrass, and beedlily (Clintonia uniflora).

14. Community type name: Mountain maple/beargrass
(Acer glabrum/X. tenax)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire
N= 20

Elevation: 1637.8 m, (stdv.= 196.5)
Aspect: 195.6°, (stdv.= 42.6)
Slope: 63.4%, (stdv.= 20.7)

Description: This is the driest and highest of the three mountain maple c.t.'s, and occurs principally in avalanche chutes. It also occurs in areas of wildfire where succession to forest cannot be confidently stated. Trees are generally present with individuals only occasionally exceeding sapling size. Important shrubs include mountain maple, thimbleberry, globe huckleberry, mountain ash, pachistima, Sitka alder, and serviceberry. Grasses and sedges (usually elk sedge) are common to well represented. Important forbs include beargrass, meadowrue, and fireweed.

15. Community type name: Serviceberry/yarrow
(Amelanchier alnifolia/Achillea millefolium)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire

Elevation: 1664.3 m, (stdv.= 193.8)
Aspect: 173.2°, (stdv.= 37.9)

N= 26 Slope: 57.2%, (stdv.= 17.6)

Description: This is a dry shrub type generally occuring on mid- to upper-slopes in avalanche chutes and also in area of wildfire where succession to forest cannot be confidently stated. Exposed rock is occasionally extensive, but is not a diagnostic feature. Douglas fir (Pseudotsuga menziesii) and subalpine fir are generally present with only a scattered few attaining maturity. Important shrubs include serviceberry, pachistima, and mountain maple. Chokecherry (Prunus virginiana) is occasionally well represented, and oregon grape (Berberis repens) was present in more than half the sample stands. Grasses (Festuca, Agropyron, Calamagrostis purpurascens) and elk sedge are generally present to well represented. Important forbs include pearly everlasting, beargrass, and roundleaf avens. This type is often bordered by Douglas fir forest.

16. Community type name: Globe huckleberry/beargrass
(Vaccinium Globulare/X. tenax)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire
N= 31

Elevation: 1918.4 m, (stdv.= 137.5)
Aspect: 167.0°, (std.= 71.4)
Slope: 50.5%, (stdv.= 25.1)

Description: This type occurs at mid- and upper-slopes in avalanche chutes and on sites affected by wildfire where succession to forest cannot be confidently stated. Aspect is southernly. Subalpine fir is usually common, but only rarely able to grow to maturity. Whitebark pine and Douglas fir are similarly present. Important shrubs include globe huckleberry and whortleberry. Mountain ash, pachistima, and subalpine spiraea are occasionally common to well represented. Important forbs include beargrass and fireweed; others are variably present to common.

17. Community type name: Whortleberry/beargrass
(V. scoparium/X. tenax)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: fire
N= 7

Elevation: 2044.4 m, (stdv.= 70.9)
Aspect: 121.3°, (stdv.= 60.7)
Slope: 34.6%, (stdv.= 28.2)

Description: This is an upper-slope and ridge top c.t. that occurs on south and southeastern exposures. The origin(s) of this type are difficult to ascertain, but are probably in wildfire. Severe climatic conditions may contribute to the stagnation of this type. Whitebark pine is usually present, but only occasionally able to grow to maturity. Whortleberry is well represented to abundant; globe huckleberry is usually common. Beargrass is ubiquitous and abundant, and glacier lily is usually common.

18. Community type name: **Shrubby cinquefoil/grass**
(Potentilla fruticosa/grass)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: fire
N= 4

Elevation: 1947.0 m, (stdv.= 50.4)
Aspect: 125.0°, (stdv.= 110.0)
Slope: 36.2%, (stdv.= 28.7)

Description: This c.t. occurs at mid- and upper-slopes. Only four stands of this type were sampled, indicating that it is relatively rare. Sample stands of this c.t. apparently originated in pre-twentieth century wildfire. Succession to forest is not occuring, based upon the limited presence and development of subalpine fire and whitebark pine. Shrubby cinquefoil is well represented to abundant. Grasses and elk sedge are common to well represented. Dry-site forbs are present where exposed bedrock provides habitat (mountain avens, paintbrush, mountain sandwort, and beargrass). Otherwise, moist site forbs such as mountain arnica, daisy (Erigeron spp.), and glacier lily are present to common.

19. Community type name: **Sitka alder/stream violet**
(Alnus sinuata/Viola glabella)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 44

Elevation: 1731.8 m, (stdv.= 177.0)
Aspect: 189.4°, (stdv.= 143.3)
Slope: 47.9%, (stdv.= 19.6)

Description: This type is characterized by a dense overstory of Sitka alder that is only occasionally broken by openings of thimbleberry, elderberry, globe huckleberry, and various forbs. Mountain ash is usually present to well represented. Important understory forbs include stream violet, false Hellebore, meadowrue, and arrowleaf groundsel. This c.t. and the Sitka alder/lady fern (Athyrium filix-femina) c.t. (below) are very similar. They are distinguished primarily on the basis of the presence and abundance of lady fern. Lady fern is only occasionally present to common in this c.t.

20. Community type name: **Sitka alder/lady fern**
(A. sinuata/Athyrium filix-femina)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 57

Elevation: 1697.5 m, (stdv.= 121.0)
Aspect: 184.6°, (stdv.= 85.7)
Slope: 60.8%, (stdv.= 19.1)

Description: This c.t. and the Sitka alder/stream violet c.t. are very similar. They are distinguished by the presence and abundance of lady fern. In this c.t. lady fern is abundant in the shrub understory, usually constituting a fairly uniform and continuous cover.

21. Community type name: **Sitka alder/beargrass**
(A. sinuata/X. tenax)

Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche, fire
N= 2

Elevation: 1828.5 m, (stdv.= 83.9)
Aspect: 212.5°, (stdv.= 46.0)
Slope: 45.0%, (stdv.= 49.5)

Description: This is an anomalous type, occuring on drier micro-sites capable of supporting alder. Aspects of sample stands were south-southwesterly. Other site characteristics were variable. For example slope ranged from 10 percent in one stand and 80 percent in the other. Sitka alder is dominant (80-90 percent canopy cover). Shrubs in the mid-layer include pachistima and globe huckleberry. The forb layer is depauperate; beargrass is well represented.

22. Community type name: Sitka alder/devil's club
(A. sinuata/Oplopanax horridum)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: avalanche
N= 8

Elevation: 1588.8 m, (stdv.= 83.9)
Aspect: 306.2°, stdv.= 117.9)
Slope: 58.9%, (stdv.= 21.3)

Description: This is a very moist sitka alder c.t. occuring on north facing slopes and ranging from toe to upper slopes in avalanche chutes and narrow, "v"-shaped stream bottoms. Slope angle is steep. Our sampling experience indicated that this type did not occur across the study area, but was limited to Quintonkon and Wheeler creeks in the north end. This is a lush type with Sitka alder the overstory dominant. Devil's club is abundant and is the mid-story dominant. thimbleberry, huckleberry elderberry, and menziesia are also usually common to well represented. Lady fern is well represented to abundant. Other forbs that are common to well represented include stream violet, foamflower (Tiarella trifoliata), arrowleaf groundsel, Brewer's mitrewort (Mitella breweri), cow parsnip, (Heracleum lanatum), oak fern (Gymnocarpium dryopteris), and baneberry (Actaea rubra). Moist site grasses and sedges are ubiquitous and common.

23. Community type name: Sitka alder/menziesia
(A. sinuata/M. ferruginea)
Vegetation type: Shrubland

Successional class: (n/a)
Disturbance: fire
N= 10

Elevation: 1776.6, (stdv.= 136.7)
Aspect: 229.5°, (stdv.= 101.5)
Slope: 50.4%, (stdv.= 21.7)

Description: This type occurs at mid- to upper-slopes. Slope angle is moderate to steep and aspect is highly variable. Most sample stands occured in areas affected by wildfire (pre-1900's). It appears that these sites are not successional to forest. Sitka alder is dominant in this type, however, menziesia is occasionally co-dominant. Menziesia occurs both as understory to the alder and as a

separate overstory, giving the c.t. a patchy, two-tiered appearance. Other common shrubs include elderberry and globe huckleberry. Arrowleaf groundsel and Brewer's mitrewort are common to well represented. Lady fern and stream violet are also usually common to well represented. Other forbs vary. Grasses, sedges, and rushes are usually present to common.

24. Community type name: Glacier lily/woodrush
(Erythronium grandiflorum/Luzula hitchcockii)
Vegetation type: Forbland

Successional class: (n/a)
Disturbance: snowsump
N= 13

Elevation: 2097.5 m, (stdv.= 132.2)
Aspect: 95.8°, (stdv.= 109.9)
Slope: 33.1%, (stdv.= 23.1)

Description: This type occurs on gentle to moderate slopes at higher elevations and on ridge tops. Areas of exposed rock and soil are often extensive, but are not diagnostic of this type. This c.t. occurs on sites with northerly aspects where snow persists into late spring and early summer. Saplings and seedlings of subalpine fir are usually common; other trees are scarce. Whortleberry is infrequently present. Other shrubs are scarce. Woodrush is usually well represented to abundant. Moist site grasses and sedges are common to well represented. Glacier lily is usually well represented to occasionally abundant. Other forbs that are usually present to well represented include spring beauty (Claytonia lanceolata), paintbrush, and white pasqueflower.

25. Community type name: Arrowleaf groundsel/Mountain arnica
(Senecio triangularis/Arnica latifolia)
Vegetation type: Forbland

Successional class: (n/a)
Disturbance: (none)
N= 65

Elevation: 1966.2 m, (stdv.= 116.2)
Aspect: 127.0°, (stdv.= 120.0)
Slope: 33.0%, (stdv.= 26.5)

Description: This is a moist, forb community type usually associated with seeps in the upper subalpine forest, (subalpine fir/woodrush h.t., menziesia phase, Pfister et al. 1977). This c.t. occurs as irregular openings or linear features within the forest type. It is also occasionally associated with Sitka alder c.t.'s similarly located in forest openings. Seedlings and saplings of subalpine fir are usually common, but this type does not evidence a successional trend to forest. Arrowleaf groundsel is typically abundant, and mountain arnica is usually well represented. Stream violet and false Hellebore are also usually common to well represented. Grasses, sedges, and rushes are ubiquitous, being common to well represented.

26. Community type name: Arrowleaf groundsel/fireweed
(S. triangularis/E. angustifolium)
Vegetation type: Forbland

Successional class: (n/a)

Elevation: 1793.2 m, (stdv.= 240.1)

Disturbance: avalanche, fire
N= 20

Aspect: 149.4°, (stdv.= 79.2)
Slope: 45.0%, (stdv.= 20.8)

Description: This type occurs on moist sites in avalanche chutes, and sites effected by wildfire. Seedlings and saplings of subalpine fir (and others) are only occasionally present. Shrubs are only infrequently present to well represented. Forbs and grasses dominate the type. Fireweed, arrowleaf groundsel, and meadowrue are usually well represented. Other forbs are variably present to well represented.

27. Community type name: Douglas fir/globe huckleberry
(P. menziesii/V. globulare)
Vegetation type: Psemen/Vacglo h.t., Xerten phase

Successional class: 2-3
Disturbance: fire
N= 24

Elevation: 1693.3 m, (stdv.= 151.0)
Aspect: 224.0°, (stdv.= 59.4)
Slope: 59.6%, (stdv.= 21.5)

Description: This type occurs primarily on west, southwesterly sites on moderate to steep slopes. Several sample stands, however, were located on northwestly sites. The type is successional to the mature Douglas fir/globe huckleberry h.t., beargrass phase of Pfister et al. (1977). Douglas fir are well represented to abundant. Subalpine fire is also occasionally present, while other tree species occur infrequently. Globe huckleberry and pachistima dominate the shrub mid-story, and are well represented. OTher shrubs usually present to well represented include mountain ash, serviceberry, and mountain maple. Pine grass (Calamagrostis rubescens) and elk sedge are occasionally present to common. Beargrass is the dominant forb, being well represented to abundant. Fireweed is occasionally present to common. Other forbs are variably present to common.

28. Community type name: Douglas fir/globe huckleberry/beargrass
(P. menziesii/V. globulare/X. tenax)
Vegetation type: Psemen/Vacglo h.t., Xerten phase

Successional class: 5
Disturbance: (none)
N= 39

Elevation: 1579.1 m, (stdv.= 165.4)
Aspect: 231.2°, (stdv.= 136.7)
Slope: 59.8%, (stdv.= 18.3)

Description: This type defines the local conditions of the mature Douglas fir/globe huckleberry h.t., beargrass phase defined by Pfister el al. (1977). Pole and mature Douglas fir dominate the type. Other tree species, including subalpine fir and Engelmann spruce are occasionally present to common. The site conditions, however, appear to favor Douglas fir. The shrub layer is variable, with globe huckleberry and pachistima dominant and mountain maple and serviceberry usually present to common. Pine grass and elk sedge (and other grasses) are usually common to occasionally well

represented. Beargrass is the dominant forb. Other forbs that are variably present to common include fireweed, mountain arnica, raceme pussytoes, and meadowrue.

29. Community type name: Douglas fir/snowberry
(P. menziesii/Symphoricarpos albus)
Vegetation type: Psemen/Symalb h.t.

Successional class: 2-3
Disturbance: fire
N= 10

Elevation: 1508.8 m, (stdv.= 163.2)
Aspect: 168.8°, (stdv.= 19.4)
Slope: 51.6%, (stdv.= 18.5)

Description: This type occurs on sites with southernly aspects and moderate to steep slopes. Seedling and saplings of Douglas fir were well represented to abundant. Subalpine fir, western larch (Larix occidentalis), and whitebark pine are occasionally present to common. Serviceberry, oregon grape, snowberry, and huckleberry are usually common to well represented. Pine grass and elk sedge are usually common to well represented as well. Bluebunch wheatgrass (Agropyron spicatum) is occasionally well represented. Forbs are generally scarce, with yarrow usually present and beargrass well represented.

30. Community type name: Mature Douglas fir/snowberry
(P. menziesii/Symphoricarpos albus)
Vegetation type: Psemen/Symalb h.t.

Successional class: 4-5
Disturbance: (none)
N= 8

Elevation: 1466.0 m, (stdv.= 195.7)
Aspect: 177.3°, (stdv.= 31.2)
Slope: 51.7%, (stdv.= 17.5)

Description: This type defines the local conditions of the mature Douglas fir/snowberry h.t. identified by Pfister et al. (1977). Slopes of sample stands were moderate and aspects were southernly. Pole and mature Douglas fir clearly dominate the overstory. Engelmann spruce was infrequently present to common. Other trees species were absent. Common to well represented shrubs included snowberry, mountain maple, serviceberry, Oregon grape, ocean spray, and chokecherry. Pinegrass and elk sedge are usually common. Western Solomon-plume (Smilacina racemosa) was ubiquitous. Other forbs usually present to common include fireweed, strawberry (Fragaria virginiana), and meadowrue.

31. Community type name: Subalpine fir/beedlily/wild sarsaparilla
(A. lasiocarpa/C. uniflora/Aralia nudicaulis)
Vegetation type: Abilas/Cliuni h.t., Aranud phase

Successional class: 5
Disturbance: (none)
N= 1

Elevation: 1097.0 m
Aspect: 334.0
Slope: 5.0%

Description: This type occurs extensively along the major creek bottoms in the study area, but was inadequately sampled in the course of our study. We, therefore, rely upon the description and data of Pfister et al. (1977) to characterize this mature forest type.

32. Community type name: Thimbleberry/fireweed
(Rubus parviflora/Epilobium angustifolium)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2
Disturbance: c.c., dozer, burn
N= 23

Elevation: 1527.2 m, (stdv.= 144.6)
Aspect: 238.7°, (144.6) 262.0)
Slope: 30.0%, (stdv.= 26.4)

Description: This is an early successional community in the subalpine fir/beedlily h.t. common to the sarsaparilla, beargrass, and menziesii phases identified by Pfister et al. (1977). All sample stands were clearcut, with post-cutting treatment including dozer-piling and pile burning. Seedlings of the subalpine are common. Seedlings of Engelmann spruce are also occasionally well represented. Other tree species vary. The shrub layer is diverse and usually multi-tiered. Thimbleberry is well represented to abundant. Sitka alder, elderberry, and globe huckleberry are usually well represented. Other shrubs that are occasionally present to common include mountain maple, menziesia, prickly current, and mountain ash. Fireweed is dominant in the forb layer. Other forbs are variously present to common, and include beedlily, starry Solomon-plume (Smilacina stellata), beargrass, strawberry, and others.

33. Community type name: Pachistima/fireweed
(Pachistima myrsinites/E. angustifolium)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2
Disturbance: c.c., doz., burn
N= 17

Elevation: 1291.1 m, (stdv.= 181.7)
Aspect: 164.8°, (stdv.= 88.7)
Slope: 22.7%, (stdv.= 15.9)

Description: This c.t. is an early successional community found at lower sites in the subalpine fir/beedlily h.t., sarsaparilla, beargrass, and menziesia phases (Pfister et al. 1977). Most sample stands were clearcut between the latter 1950's to the mid 1960's. Additional treatments include dozer piling, and pile burning. Seedlings of subalpine fir, western larch, and Engelmann spruce are usually common to well represented. Paper birch (Betula paperifera) is occasionally present. The shrub layer is diverse, and usually multi-tiered. Species that are common to well represented include pachistima, mountain maple, thimbleberry, snowberry, and Sitka alder. Other shrub species are variably present. Sedges and grasses are generally common. Fireweed is well represented to abundant in the forb layer. Other forbs, such as starry Solomon-plume and beedlily are usually present to common. Beargrass is occasionally well represented. Other forbs are variably present to common.

34. Community type name: Mountain maple/fireweed
(A. glabrum/E. angustifolium)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2

Elevation: 1421.6 m, (stdv.= 136.3)

Disturbance: c.c., doz., burn
N= 52

Aspect: 193.6°, (stdv.= 158.9)
Slope: 45.6%, (stdv.= 18.9)

Description: This c.t. is an early successional community found on mid- and lower-slopes in the subalpine fir/beedlily h.t. (primarily the beargrass and menziesia phases, Pfister et al. 1977). All sample stand had been clearcut between the latter 1950's and the latter 1970's, a broad span of time that may indicate successional stagnation. Additional silvicultural treatments include dozer-piling, and pile burning. Seedlings and saplings of of subalpine fir and Engelmann spruce are common to well represented. Other tree species are occasionally present and common. Mountain maple is usually well represented to abundant. Thimbleberry is well represented. Other shrubs that are usually present to common include globe huckleberry, mountain ash, pachistima, and Sitka alder. Grasses and sedges are usually common to well represented. Fireweed is well represented to abundant. Beedlily, meadowrue, and starry Solomon-plume are usually common. Other forbs are only occasionally present to well represented.

35. Community type name: **Western larch/pachistima**
(Larix occidentalis/Pachistima myrsinites)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 3-4
Disturbance: c.c., dozer, burn
N= 26

Elevation: 1292.6 m, (stdv.= 148.4)
Aspect: 158.8°, (stdv.= 118.3)
Slope: 27.3%, (stdv.= 17.3)

Description: This is a sapling and pole c.t. occuring on drier sites at mid- and lower-slopes, and on most aspects in the subalpine fir/beedlily h.t., beargrass and menziesia phases (Pfister et la. 1977). Western larch is the apparent dominant, being well represented to abundant in all stands. Subalpine fir is common to well represented. Engelmann spruce and lodgepole pine are usually common. Shrub cover is diverse. Globe huckleberry and pachistima are well represented to abundant. Utah honeysuckle (Lonicera utahensis), mountain maple, Sitka alder, thimbleberry, and mountain ash are usually common to well represented. Grasses and sedges (elk sedge) are also usually common to well represented. Fireweed is most abundant in the forb layer. Beargrass is usually well represented to abundant. Starry Solomon-plume and beedlily are usually common.

36. Community type name: **Douglas fir/pachistima**
(P. menziesii/Pachistima myrsinites)
Vegetation type: Abilas/Cliuni or Psemen/Vacglo h.t.'s

Successional class: 3-4
Disturbance: fire
N= 22

Elevation: 1539.0 m, (stdv.= 164.6)
Aspect: 198.0°, (stdv.= 80.8)
Slope: 53.8%, (stdv.= 20.1)

Description: This type results from wildfire, and occurs fairly extensively over the study area. Few adjacent mature stands exist from which to determine the actual site potential of this c.t. It is unclear whether the site potential is subalpine fir/beedlily or Douglas fir/globe huckleberry (Pfister et al. 1977). Most sample stands were located on south and southwest facing slopes; a few were on north facing slopes. Slope angle of this type is generally moderate to steep. The c.t. ranges from lower- to upper-slopes. Douglas fir is the apparent dominant being well represented to abundant. Subalpine fir and Engelmann spruce are well represented. Lodgepole pine is occasionally well represented. Some sample stands of this type had total tree canopy closures in excess of 70 percent. Pachistima is well represented in all stands. Globe huckleberry, mountain maple, mountain ash, and thimbleberry were well represented in most stands. Sitka alder and willow (Salix scouleriana) are usually common. Grasses and elk sedge are also occasionally common. Beargrass is usually well represented to abundant in the forb layer, and mountain arnica is usually well represented. Other forb species are less frequently present to common. Mountain arnica, fireweed, and false Solomon's seal are present to common.

37. Community type name: **Subalpine fir/globe huckleberry**
(A. lasiocarpa/V. globulare)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2-3
Disturbance: c.c., scar., burn
N= 20

Elevation: 1396.1 m, (stdv.= 117.2)
Aspect: 236.5°, (stdv.= 207.4)
Slope: 36.3%, (stdv.= 19.2)

Description: This c.t. is typical of drier sites in the Abilas/Cliuni h.t. (Pfister et al. 1977) at the shrub and sapling stages of successional development. Sample stands included sites with potential for both the menziesia and beargrass phases of the habitat type. As a result, aspect of sample stands were highly variable. Subalpine fir is well represented, and Engelmann spruce is generally common. Shrub cover is heterogeneous, with principal species including globe huckleberry, mountain maple, Sitka alder, pachistima, western yew, and thimbleberry. Grasses are ubiquitous, and sedges are generally common. Beedlily, fireweed, and mountain arnica are common to well-represented in the forb layer.

38. Community type name: **Subalpine fir/globe huckleberry**
(A. lasiocarpa/V. globulare)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2-3
Disturbance: fire
N= 15

Elevation: 1675.3 m, (stdv.= 153.5)
Aspect: 220.1°, (stdv.= 81.0)
Slope: 59.8%, (stdv.= 17.9)

Description: This c.t. apparently originates in wildfire. It is similar (45%) to the subalpine fir/globe huckleberry c.t. (above), but differs in it origin and the relative amounts of important taxa. Seedlings

and saplings of subalpine for are well represented. Engelmann spruce and Douglas fir are usually common to well represented. Globe huckleberry is well represented to abundant. Pachistima is common to well represented, and mountain maple is generally common. Elk sedge is present to common, and other grasses only occasionally present. Bear grass is well represented to abundant and clearly dominates the forb layer. Other forbs are variably present to common. Beedlily is infrequently present.

39. Community type name: Subalpine fir/beedlily/beargrass
(A. lasiocarpa/C. uniflora/X. tenax)
Vegetation type: Abilas/Cliuni h.t., Xerten phase

Successional class: 5
Disturbance: (none)
N= 34

Elevation: 1588.8 m, (stdv.= 157.7)
Aspect: 171.2°, (stdv.= 53.1)
Slope: 49.0%, (stdv.= 15.6)

Description: This type defines the local condition of the mature subalpine fir/beedlily h.t., beargrass phase, identified by Pfister et al. (1977). Mature trees are well represented to abundant and dominate the stand. Subalpine fir is dominant with Engelmann spruce prominent in most sample stands. Douglas fir is occasionally well represented and possibly co-dominant or dominant on drier sites. Shrub cover is heterogeneous. Globe huckleberry, mountain maple, and mountain ash are common to well represented. Grasses and elk sedge are generally common to well represented. Beargrass is well represented to abundant. Beedlily is common. Other forbs are variably present to common.

40. Community type name: Subalpine fir/menziesia
(A. lasiocarpa/M. ferruginea)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2-3
Disturbance: c.c., scar., burn
N= 59

Elevation: 1789.4 m, (stdv.= extreme)
Aspect: 174.9°, (stdv.= 189.4)
Slope: 37.6%, (stdv.= 20.4)

Description: This c.t. is typical of moist sites in the Abilas/Cliuni h.t. at the the seedling and sapling stages of successional development. Menziesia is highly successful throughout the study area at most elevation and aspects, resulting in this type's broad distribution. Accordingly, elevation, aspect, and slope are highly variable. Seedlings and saplings of subalpine fir and Engelmann spruce are common to well represented. Other tree species vary. Menziesia and globe huckleberry are well represented to abundant. Other shrubs usually present to well represented include Sitka alder, Utah honeysuckle, prickly currant, mountain ash, pachistima, thimbleberry, and elderberry. Mesic site grasses and pearly everlasting are common on heavily scarified sites. Important forbs include fireweed and arrowleaf groundsel.

41. Community type name: Subalpine fir/menziesia

(A. lasiocarpa/M. ferruginea)
Vegetation type: Abilas/Cliuni h.t.

Successional class: 2-3
Disturbance: wildfire
N= 17

Elevation: 1749.4 m, (stdv.= 108.9)
Aspect: 273.4°, (stdv.= 229.0)
Slope: 52.9%, (stdv.= 26.4)

Description: This c.t. is very similar (57%) to the subalpine fir/menziesia c.t. (above), but differs in the its origin (wildfire) and relative amounts of important taxa. Seedlings and saplings of subalpine fir and Engelmann spruce are common to well represented. Menziesia is abundant, and globe huckleberry is well represented to abundant. Mountain ash is usually common. Beargrass is common to well represented, and mountain arnica is usually common. Other forbs vary.

42. Community type name: Subalpine fir/beedlily/menziesia
(A. lasiocarpa/C. uniflora/M. ferruginea)
Vegetation type: Abilas/Cliuni h.t., Menfer phase

Successional class: 5
Disturbance: (none)
N= 64

Elevation: 1689.9 m, (stdv.= 112.6)
Aspect: 204.9°, (stdv.= 152.0)
Slope: 51.2%, (stdv.= 19.0)

Description: This type defines the local condition of the mature subalpine fir/beedlily h.t., menziesia phases identified by Pfister et al. (1977). The elevational ranges of sample stands encompasses fairly broad vegetative diversity, including the lower portion of Pfister et al.'s (1977) Abilas/Menfer h.t., and what Arno et al (1986) defined as the warm, moist phase of the same h.t. Subalpine fir is clearly dominant in the overstory, and Engelmann spruce is common. Menziesia is abundant and globe huckleberry is well represented to abundant. Mountain ash, Sitka alder, and thimbleberry are occasionally common. In the forb layer, grasses, mountain arnica, meadowrue, and arrowleaf groundsel are generally common.

43. Community type name: Subalpine fir/beargrass
(A. lasiocarpa/X. tenax)
Vegetation type: Abilas/Xerten h.t., Vacglo phase

Successional class: 4-5
Disturbance: (none)
N= 27

Elevation: 1825.7 m, (stdv.= 109.6)
Aspect: 231.7°, (stdv.= 159.7)
Slope: 57.3%, (stdv.= 19.8)

Description: This type defines the local conditions of the mature subalpine fir/beargrass h.t., globe huckleberry phase defined by Pfister et al. (1977). Pole and mature subalpine fir are well represented to abundant. Whitebark pine and Engelmann spruce are usually present to common, and lodgepole pine (P. contorta) is occasionally well represented to abundant. Globe huckleberry is well represented to abundant. Other important shrubs include whortleberry, mountain ash, and pachistima. Grasses are

scarce, and elk sedge is usually present to common. Beargrass dominated the forb layer. Other forbs are variably present to common.

44. Community type name: **Subalpine fir/globe huckleberry**
(A. lasiocarpa/V. globulare)
Vegetation type: Abilas/Xerten h.t., Vacglo phase

Successional class: 2-3
Disturbance: fire
N= 34

Elevation: 1815.6 m, (stdv.= 113.3)
Aspect: 170.2°, (stdv.= 36.0)
Slope: 62.5%, (stdv.= 15.0)

Description: This type occurs at mid- and upper-slopes having a predominantly southern exposure. The type originates in wildfire. Seedling and saplings of subalpine fir, whitebark pine, and Engelmann spruce are common to well represented. Important shrubs include globe huckleberry, pachistima, mountain ash, whortleberry, and serviceberry. Elk sedge is usually present to common. Grasses are scarce. In the forb layer, beargrass is dominant. Other forbs are variably present to common.

45. Community type name: **Globe huckleberry/beargrass**
(V. globulare/X. tenax)
Vegetation type: Abilas/Luzhit h.t.

Successional class: 2 -3
Disturbance: fire, avalanche
N= 28

Elevation: 2002.4 m, (stdv.= 109.9)
Aspect: 144.9°, (stdv.= 60.0)
Slope: 49.6%, (stdv.= 22.8)

Description: This type occurs at higher elevations with predominantly southern aspects. The c.t. is similar (57%) to the subalpine fir/globe huckleberry c.t. (below), but differs primarily in the density of the developing tree layer. Seedlings and saplings of subalpine fir and whitebark pine are present to common. Globe huckleberry is the dominant shrub; whortleberry is intermixed with beargrass which dominates the forb layer. Fireweed, grasses, and woodrush are occasionally common.

46. Community type name: **Subalpine fir/globe huckleberry**
(A. lasiocarpa/Vaccinium globulare)
Vegetation type: Abilas/Luzhit h.t.

Successional class: 2-3
Disturbance: fire
N= 79

Elevation: 2004.5 m, (stdv.= 104.3)
Aspect: 145.9°, (stdv.= 158.6)
Slope: 49.0%, (stdv.= 22.3)

Description: The site and vegetative characteristics of this type are nearly identical with those of the globe huckleberry/beargrass c.t. (above). This c.t., however, is distinguished by its well developed tree seedling and sapling layer. Young subalpine fir are well represented to abundant, and whitebark pine is present to common. Globe huckleberry is the dominant shrub. Whortleberry is intermixed in the forb layer with beargrass, which is abundant. Woodrush (Luzula hitchcockii) is generally well represented, and grasses and elk sedge are occasionally present to common.

47. Community type name: **Subalpine fir/woodrush/whortleberry**
(A. lasiocarpa/Luzula hitchcockii/V. scoparium)
Vegetation type: Abilas/Luzhit h.t., Xerten phase

Successional class: 5
Disturbance: (none)
N= 48

Elevation: 1979.2 m, (stdv.= 82.9)
Aspect: 160.5°, (stdv.= 139.0)
Slope: 37.7%, (stdv.= 19.2)

Description: This type defines the local conditions of the mature subalpine fir/woodrush h.t., beargrass phase identified by Pfister et al. (1977). The type occurs on upper slopes with southern exposure. Slope angle is moderate to steep in this type. Pole and mature subalpine fir dominate the stand; whitebark pine is scattered but common. Globe huckleberry is well represented to abundant and dominates the understory. Beargrass is dominant in the forb layer with whortleberry intermixed. Woodrush is common to well represented. Mountain arnica and glacier lily are occasionally present to common. Other forbs vary.

48. Community type name: **Subalpine fir/menziesia**
(A. lasiocarpa/Menziesia ferruginea)
Vegetation type: Abilas/Luzhit h.t.

Successional class: 2-3
Disturbance: fire, avalanche
N= 56

Elevation: 1921.9 m, (stdv.= 68.6)
Aspect: 136.2°, (stdv.= 160.2)
Slope: 48.9%, (stdv.= 23.9)

Description: This c.t. apparently originates in wildfire, and occasionally from avalanche. Sample stands occured on sites with northerly aspect, and moderate to steep slopes. Seedlings and saplings of subalpine fir are common to well represented. Whitebark pine and Engelmann spruce are also occasionally present to common. Menziesia is usually abundant and dominant in the shrub layer. Globe huckleberry is common to well represented. Other shrubs are variably present to common. The forb layer is highly variable. Woodrush and beargrass are generally common to well represented. Mountain arnica, fireweed, and false Solomon's seal are present to common.

49. Community type name: **Subalpine fir/woodrush/menziesia**
(S. lasiocarpa/L. hitchcockii/M. ferruginea)
Vegetation type: Abilas/Luzhit h.t., Menfer phase

Successional class: 5
Disturbance: (none)
N= 111

Elevation: 1982.1 m, (stdv.= 772.6)
Aspect: 188.6°, (stdv.= 203.2)
Slope: 46.0%, (stdv.= 23.4)

Description: This type defines the local conditions of the mature subalpine fir/woodrush h.t., menziesia phase identified by Pfister et al. (1977). The type occurs on upper, moderate to steep slopes. Aspects of sample stands was quite variable, reflecting the generally very moist conditions of the study area. Subalpine fir is abundant and dominates the tree overstory. White bark pine and

Engelmann spruce are also usually present to common. Menziesia dominates the shrub understory. Globe huckleberry is also well-represented to abundant. Beargrass is common to occasionally abundant. Mountain arnica and arrowleaf groundsel are usually present to common. Woodrush is common to well represented. Other forbs and sedges are variably present to common.

50. Community type name: Subalpine fir/woodrush
(S. lasiocarpa/L. hitchcockii)
Vegetation type: Abilas/Luzhit h.t.,

Successional class: 2-3
Disturbance: snowsump
N= 10

Elevation: 2109.6 m, (stdv.= 48.1)
Aspect: 88.16°, (stdv.= 1203.72)
Slope: 37.0%, (stdv.= 13.2)

Description: This is an upper subalpine c.t. found on sites at the altitudinal limit of the Subalpine fir/woodrush h.t. (Pfister et al. 1977). The type is found in openings in the mature forest. Aspects are northerly and slopes are moderate to to steep. Saplings and seedlings of subalpine fir are well represented to abundant, and dominate the tree layer. Whitebark pine and Engelmann spruce are only occasionally present to common. Woodrush is clearly the dominant taxa, being well represented to abundant. glacier lily and mountain arnica are also common to well represented.

51. Community type name: Whitebark pine/whortleberry
(P. albicaulis/V. scoparium)
Vegetation type: Abilas/Luzhit h.t.

Successional class: 4-5
Disturbance: (none)
N= 10

Elevation: 1977.8 m, (stdv.= 109.7)
Aspect: 220.3°, (stdv.= 75.7)
Slope: 52.8%, (stdv.= 31.7)

Description: This type is found in the upper subalpine zone and is probably transitional to the whitebark pine and subalpine fir h.t.'s described by Pfister et al. (1977). Pole and mature subalpine fir and whitebark pine are ubiquitous with whitebark pine the apparent dominant. Lodgepole pine is occasionally well represented to abundant. Globe huckleberry and whortleberry are dominant in the shrub layer. Beargrass is also well represented to abundant. Woodrush and elk sedge are usually common to well represented. Mountain arnica, glacier lily, and grasses are occasionally present to common. Other forbs are scarce.

Appendix C

Constancy and Average Cover Tables

Errata: Several errors in nomenclature and several omissions are present in these tables. Nomenclature errors include: ALNVIR=ALNSIN, HERSPH=HERLAN, LUZGLA=LUZHIT, SEDUMX=SEDLAN, PENFLO=POTFRU, and SPESPI=AGRSPI. In addition, ALNINC and all other taxa that did not occur at least ten time in the data, have been omitted due to the selections criteria used to build these tables.

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	* SLAB ROCK N = 13	* ROCKLAND-GRASS N = 21	* MESIC CAREX N = 9	* HY-MES CAREX N = 11	* MES-XERIC GRAM N = 90	* SALIX/CAREX N = 12	* ALNINC/ATHFIL N = 5
***** TREES *****							
ABILAS	33.3(3.9)	57.1(1.9)	77.8(.9)	72.7(4.1)	32.2(1.3)	83.3(2.9)	.0(.0)
PICENG	.0(.0)	.0(.0)	.0(.0)	18.2(5.3)	7.8(1.2)	50.0(3.3)	60.0(1.3)
PINALB	66.7(1.9)	52.4(4.2)	11.1(.5)	36.4(1.8)	33.3(.8)	16.7(.5)	.0(.0)
PINCON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	11.1(2.4)	.0(.0)	.0(.0)
PSEMEN	.0(.0)	9.5(1.8)	.0(.0)	.0(.0)	54.4(3.0)	.0(.0)	20.0(3.0)
***** SHRUBS *****							
ACEGLA	5.6(.5)	19.0(1.1)	.0(.0)	.0(.0)	36.7(2.0)	.0(.0)	60.0(7.7)
ALNVIR	.0(.0)	4.8(.5)	.0(.0)	18.2(1.8)	2.2(15.2)	16.7(3.0)	20.0(80.0)
AMEALN	5.6(3.0)	38.1(1.4)	.0(.0)	.0(.0)	71.1(5.3)	.0(.0)	.0(.0)
BERREP	.0(.0)	9.5(1.8)	.0(.0)	.0(.0)	31.1(1.2)	.0(.0)	.0(.0)
HOLDIS	.0(.0)	.0(.0)	.0(.0)	.0(.0)	12.2(3.1)	.0(.0)	.0(.0)
JUNCOM	27.8(2.9)	52.4(4.9)	.0(.0)	.0(.0)	43.3(1.3)	.0(.0)	.0(.0)
LONINV	.0(.0)	.0(.0)	.0(.0)	9.1(.5)	.0(.0)	50.0(2.9)	.0(.0)
LONUTA	.0(.0)	4.8(.5)	.0(.0)	.0(.0)	4.4(.5)	.0(.0)	.0(.0)
MENFER	5.6(.5)	.0(.0)	11.1(3.0)	54.5(3.7)	3.3(1.3)	58.3(1.6)	.0(.0)
PACMYR	5.6(10.0)	23.8(1.5)	.0(.0)	.0(.0)	64.4(3.2)	.0(.0)	.0(.0)
PENFLO	.0(.0)	38.1(7.5)	.0(.0)	9.1(.5)	2.2(1.8)	50.0(2.1)	.0(.0)
PRUVIR	.0(.0)	4.8(3.0)	.0(.0)	.0(.0)	16.7(2.9)	.0(.0)	.0(.0)
RIBLAC	.0(.0)	9.5(.5)	.0(.0)	.0(.0)	5.6(1.0)	8.3(3.0)	20.0(.5)
RUBPAR	5.6(.5)	4.8(3.0)	.0(.0)	.0(.0)	23.3(1.4)	.0(.0)	60.0(2.2)
SALIXX	.0(.0)	.0(.0)	.0(.0)	36.4(1.8)	8.9(.8)	100.0(23.3)	.0(.0)
SAMRAC	.0(.0)	.0(.0)	.0(.0)	9.1(.5)	4.4(1.1)	8.3(.5)	20.0(.5)
SORSCO	38.9(.9)	42.9(.8)	.0(.0)	.0(.0)	40.0(1.0)	25.0(1.3)	.0(.0)
SPIBET	5.6(.5)	38.1(1.4)	.0(.0)	.0(.0)	54.4(3.5)	.0(.0)	.0(.0)
SPIDEN	83.3(3.4)	19.0(3.5)	11.1(3.0)	54.5(5.0)	13.3(3.8)	66.7(4.8)	.0(.0)
SYMALB	.0(.0)	14.3(1.3)	.0(.0)	.0(.0)	17.8(3.1)	.0(.0)	60.0(16.7)
VACGLO	77.8(4.5)	47.6(3.9)	11.1(.5)	63.6(.9)	38.9(2.1)	33.3(1.1)	.0(.0)
VACSCO	50.0(3.7)	28.6(.9)	22.2(5.3)	36.4(.5)	17.8(2.4)	33.3(1.1)	.0(.0)
***** GRASSES *****							
CALCAN	.0(.0)	.0(.0)	.0(.0)	18.2(3.0)	.0(.0)	33.3(18.2)	40.0(35.0)
CALPUR	5.6(3.0)	4.8(40.0)	.0(.0)	.0(.0)	11.1(21.3)	.0(.0)	.0(.0)
CAREXX	61.1(7.8)	42.9(9.5)	66.7(40.5)	100.0(32.4)	25.7(12.5)	100.0(36.7)	40.0(11.5)
CARGEY	22.2(8.4)	52.4(6.2)	.0(.0)	.0(.0)	74.4(9.3)	.0(.0)	20.0(.5)
FESIDA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	12.2(9.0)	.0(.0)	.0(.0)
GRASSP	66.7(2.1)	66.7(5.7)	66.7(15.6)	81.8(5.9)	37.8(11.9)	75.0(11.6)	40.0(15.0)
JUNPAR	50.0(14.0)	23.8(7.2)	33.3(16.8)	.0(.0)	5.6(31.8)	.0(.0)	.0(.0)
LUPINU	.0(.0)	.0(.0)	.0(.0)	.0(.0)	26.7(.8)	.0(.0)	.0(.0)
LUZGLA	72.2(5.8)	9.5(1.8)	88.9(12.9)	18.2(1.8)	7.8(1.2)	25.0(.5)	.0(.0)
PSESPI	.0(.0)	9.5(15.0)	11.1(10.0)	.0(.0)	48.9(20.1)	.0(.0)	.0(.0)
VULPIA	16.7(11.0)	14.3(10.0)	.0(.0)	.0(.0)	22.2(11.6)	8.3(3.0)	.0(.0)
***** FORBS *****							
ACHMIL	33.3(1.3)	71.4(1.3)	.0(.0)	.0(.0)	91.1(3.0)	.0(.0)	.0(.0)
ACTRUB	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	40.0(1.8)
AGAURT	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.1(.5)	.0(.0)	.0(.0)
ANAMAR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.6(1.0)	.0(.0)	.0(.0)

ANGARG	.0(.0)	.0(.0)	.0(.0)	9.1(.5)	1.1(.5)	8.3(.5)	.0(.0)	
ANTMIC	5.6(.5)	19.0(.5)	.0(.0)	.0(.0)	38.9(2.3)	.0(.0)	.0(.0)	
ANTRAC	5.6(.5)	4.8(10.0)	.0(.0)	.0(.0)	45.6(3.0)	.0(.0)	.0(.0)	
APOAND	.0(.0)	.0(.0)	.0(.0)	.0(.0)	23.3(4.3)	.0(.0)	.0(.0)	
ARECAP	44.4(.5)	47.6(1.3)	.0(.0)	.0(.0)	44.4(1.9)	.0(.0)	.0(.0)	
ARNLAT	61.1(4.7)	.0(.0)	44.4(1.1)	27.3(1.3)	11.1(2.6)	25.0(1.3)	.0(.0)	
ASTCON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.6(2.9)	8.3(3.0)	.0(.0)	
ASTENG	5.6(3.0)	4.8(10.0)	.0(.0)	.0(.0)	2.2(5.3)	.0(.0)	.0(.0)	
ASTERX	16.7(1.3)	4.8(.5)	22.2(1.8)	36.4(4.8)	11.1(2.4)	25.0(2.2)	.0(.0)	
ATHFIL	.0(.0)	4.8(.5)	.0(.0)	9.1(.5)	.0(.0)	8.3(.5)	100.0(44.1)	
BALSAG	.0(.0)	4.8(3.0)	.0(.0)	.0(.0)	32.2(4.9)	.0(.0)	.0(.0)	
CALAPI	.0(.0)	4.8(.5)	.0(.0)	.0(.0)	25.6(4.8)	.0(.0)	.0(.0)	
CAMROT	11.1(.5)	28.6(.5)	.0(.0)	.0(.0)	16.7(.5)	.0(.0)	.0(.0)	
CASTIL	38.9(2.6)	33.3(1.6)	.0(.0)	36.4(.5)	44.4(3.1)	16.7(.5)	.0(.0)	
CIRSIU	.0(.0)	9.5(.5)	.0(.0)	.0(.0)	10.0(.8)	8.3(.5)	20.0(3.0)	
CLIUNI	5.6(3.0)	.0(.0)	.0(.0)	.0(.0)	2.2(.5)	.0(.0)	20.0(.5)	
CRYCRI	.0(.0)	9.5(.5)	.0(.0)	.0(.0)	8.9(.8)	.0(.0)	.0(.0)	
EPIANG	16.7(1.3)	33.3(.9)	.0(.0)	.0(.0)	41.1(2.0)	33.3(1.8)	60.0(16.7)	
EQUARV	.0(.0)	.0(.0)	11.1(10.0)	45.5(11.2)	.0(.0)	53.3(2.6)	60.0(5.3)	
ERIFLA	33.3(1.8)	52.4(5.1)	.0(.0)	.0(.0)	52.2(7.1)	.0(.0)	.0(.0)	
ERIGER	33.3(.9)	28.6(1.3)	22.2(1.8)	45.5(3.4)	27.8(3.1)	66.7(1.4)	.0(.0)	
ERIPER	44.4(3.7)	19.0(.5)	44.4(2.4)	27.3(2.2)	8.9(1.8)	25.0(3.0)	.0(.0)	
ERYGRA	88.9(7.7)	42.9(2.9)	66.7(4.5)	27.3(4.5)	44.4(4.5)	16.7(1.8)	20.0(.5)	
FRAVIR	.0(.0)	14.3(1.3)	.0(.0)	9.1(.5)	42.2(1.7)	.0(.0)	20.0(.5)	
GALTRI	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.3(.5)	60.0(3.7)	
HERSPH	.0(.0)	4.8(3.0)	.0(.0)	9.1(.5)	3.3(.5)	8.3(3.0)	20.0(.5)	
HEUCYL	27.8(1.5)	61.9(3.7)	.0(.0)	.0(.0)	75.6(2.2)	.0(.0)	.0(.0)	
LOMCOU	11.1(.5)	.0(.0)	.0(.0)	.0(.0)	14.4(.9)	.0(.0)	.0(.0)	
LOMDIS	5.6(20.0)	19.0(1.8)	.0(.0)	.0(.0)	32.2(2.5)	.0(.0)	.0(.0)	
MITBRE	5.6(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	16.7(.5)	.0(.0)	
MYOLAX	.0(.0)	.0(.0)	.0(.0)	.0(.0)	2.2(.5)	.0(.0)	.0(.0)	
PARFIM	.0(.0)	.0(.0)	.0(.0)	9.1(10.0)	.0(.0)	58.3(1.9)	.0(.0)	
PEDBRA	.0(.0)	.0(.0)	11.1(.5)	18.2(1.8)	1.1(.5)	16.7(.5)	.0(.0)	
PEDCON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	7.8(1.6)	8.3(.5)	.0(.0)	
PENLYA	44.4(6.6)	47.6(7.3)	.0(.0)	.0(.0)	50.0(1.3)	.0(.0)	.0(.0)	
PENSTE	33.9(9.1)	23.8(12.7)	.0(.0)	9.1(20.0)	3.9(1.4)	.0(.0)	.0(.0)	
POLLON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.1(.5)	.0(.0)	.0(.0)	
POTARG	5.6(.5)	19.0(1.8)	.0(.0)	.0(.0)	8.9(1.1)	.0(.0)	.0(.0)	
PTEAQU	.0(.0)	4.8(.5)	.0(.0)	.0(.0)	2.2(5.3)	.0(.0)	60.0(13.5)	
RANUNC	16.7(2.2)	.0(.0)	11.1(30.0)	9.1(3.0)	2.2(5.3)	16.7(3.0)	.0(.0)	
SEDUMX	44.4(.5)	47.6(.5)	.0(.0)	.0(.0)	47.8(.8)	.0(.0)	.0(.0)	
SENINT	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.9(2.3)	.0(.0)	.0(.0)	
SENMEG	.0(.0)	14.3(.5)	.0(.0)	.0(.0)	6.7(3.8)	.0(.0)	.0(.0)	
SENTRI	5.6(3.0)	4.8(3.0)	55.6(5.3)	90.9(7.3)	3.3(1.3)	100.0(12.2)	60.0(7.7)	
SMIRAC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.6(.5)	.0(.0)	.0(.0)	
SMISTE	.0(.0)	.0(.0)	.0(.0)	.0(.0)	3.3(.5)	.0(.0)	60.0(23.3)	
THAOCC	5.6(3.0)	14.3(.5)	11.1(3.0)	.0(.0)	6.7(.5)	66.7(3.3)	20.0(.5)	
URTDIO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	80.0(10.7)	
VALSIT	5.6(.5)	9.5(.5)	22.2(1.8)	27.3(.5)	10.0(2.7)	33.3(1.1)	.0(.0)	
VERVIR	.0(.0)	.0(.0)	44.4(1.1)	54.5(2.1)	1.1(.5)	75.0(3.4)	80.0(1.1)	
VIOGLA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.1(.5)	.0(.0)	60.0(7.8)	
WOODRE	22.2(3.5)	14.3(6.8)	.0(.0)	.0(.0)	15.6(1.4)	.0(.0)	.0(.0)	
XERTEN	88.9(7.6)	76.2(2.2)	11.1(.5)	45.5(.5)	61.1(6.2)	33.3(1.1)	.0(.0)	

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	SPIDEN/SENTRI N = 29	RUBPAR/THAOCC N = 31	RUBPAR/XERTEN N = 17
***** TREES *****			
ABILAS	79.3(4.6)	54.8(1.1)	88.2(1.6)
PICENG	41.4(1.7)	22.6(1.2)	52.9(.8)
PINALB	27.6(.8)	3.2(.5)	29.4(1.0)
PINCON	.0(.0)	.0(.0)	5.9(.5)
PSEMEN	.0(.0)	16.1(4.4)	29.4(1.5)
***** SHRUBS *****			
ACEGLA	10.3(.5)	38.7(1.5)	70.6(2.3)
ALNVIR	72.4(14.8)	29.0(5.1)	41.2(2.9)
AMEALN	3.4(3.0)	16.1(.5)	58.8(3.6)
BERREP	.0(.0)	.0(.0)	35.3(2.1)
HOLDIS	.0(.0)	.0(.0)	.0(.0)
JUNCOM	3.4(3.0)	.0(.0)	17.6(.5)
LONINV	34.5(5.6)	19.4(4.5)	.0(.0)
LONUTA	13.8(1.1)	6.5(1.8)	17.6(1.3)
MENFER	48.3(6.9)	9.7(.5)	11.8(1.8)
PACMYR	6.9(1.8)	12.9(2.9)	94.1(6.9)
PENFLO	10.3(3.0)	.0(.0)	11.8(1.8)
PRUVIR	.0(.0)	.0(.0)	29.4(4.4)
RIBLAC	48.3(1.4)	29.0(3.2)	23.5(.5)
RUBPAR	55.2(6.3)	96.8(36.1)	88.2(15.6)
SALIXX	6.9(1.8)	6.5(3.0)	23.5(.5)
SAMRAC	75.9(3.4)	45.2(2.6)	11.8(1.8)
SORSCO	82.8(10.6)	74.2(4.9)	76.5(7.9)
SPIBET	10.3(.5)	16.1(2.0)	52.9(2.7)
SPIDEN	96.6(24.5)	35.5(3.4)	17.6(3.7)
SYMALB	6.9(.5)	38.7(13.3)	47.1(10.0)
VACGLO	48.3(5.3)	25.8(5.0)	70.6(3.2)
VACSCO	17.2(6.3)	3.2(.5)	29.4(2.9)
***** GRASSES *****			
CALCAN	.0(.0)	6.5(21.5)	.0(.0)
CALPUR	.0(.0)	.0(.0)	.0(.0)
CAREXX	65.5(7.5)	41.9(4.8)	52.9(3.7)
CARGEY	17.2(2.9)	38.7(2.7)	35.3(9.3)
FESIDA	.0(.0)	.0(.0)	.0(.0)
GRASSP	79.3(5.2)	71.0(6.1)	88.2(4.9)
JUNPAR	3.4(3.0)	.0(.0)	.0(.0)
LUPINU	3.4(3.0)	3.2(.5)	5.9(.5)
LUZGLA	27.6(6.0)	.0(.0)	5.9(.5)
PSESPI	.0(.0)	6.5(11.5)	.0(.0)
VULPIA	.0(.0)	.0(.0)	.0(.0)
***** FORBS *****			
ACHMIL	6.9(1.8)	12.9(.5)	76.5(1.8)
ACTRUB	20.7(2.5)	16.1(1.5)	.0(.0)
AGAURT	10.3(3.7)	25.8(3.8)	11.8(.5)
ANAMAR	3.4(10.0)	6.5(.5)	41.2(.9)

ANGARG	10.3(1.3)	16.1(1.5)	29.4(2.9)
ANTMIC	.0(.0)	.0(.0)	11.8(.5)
ANTRAC	.0(.0)	3.2(.5)	5.9(10.0)
APOAND	.0(.0)	.0(.0)	11.8(15.2)
ARECAP	.0(.0)	.0(.0)	.0(.0)
ARNLAT	27.6(3.5)	25.8(7.7)	23.5(4.1)
ASTCON	3.4(.5)	12.9(1.1)	5.9(10.0)
ASTENG	13.8(5.9)	9.7(4.5)	11.8(6.5)
ASTERX	17.2(2.0)	6.5(5.3)	47.1(3.6)
ATHFIL	27.6(2.6)	22.6(3.6)	.0(.0)
BALSAG	3.4(3.0)	.0(.0)	.0(.0)
CALAPI	6.9(.5)	.0(.0)	.0(.0)
CAMROT	.0(.0)	6.5(.5)	35.3(.5)
CASTIL	20.7(.5)	19.4(1.8)	52.9(3.9)
CIRSIU	13.8(.5)	35.5(.7)	35.3(.5)
CLIUNI	17.2(5.3)	16.1(5.3)	17.6(10.2)
CRYCRI	.0(.0)	.0(.0)	.0(.0)
EPIANG	82.8(9.8)	93.5(17.1)	94.1(10.2)
EQUARV	6.9(11.5)	.0(.0)	.0(.0)
ERIFLA	3.4(.5)	.0(.0)	17.6(.5)
ERIGER	37.9(4.5)	38.7(6.2)	17.6(10.2)
ERIPER	.0(.0)	3.2(3.0)	35.3(3.3)
ERYGRA	34.5(4.1)	38.7(1.8)	.0(.0)
FRAVIR	10.3(1.3)	12.9(.5)	47.1(1.8)
GALTRI	27.6(3.5)	41.9(2.7)	5.9(.5)
HERSPH	62.1(5.1)	87.1(5.0)	23.5(3.5)
HEUCYL	6.9(1.8)	3.2(.5)	17.6(.5)
LOMCOU	.0(.0)	.0(.0)	.0(.0)
LOMDIS	3.4(.5)	6.5(1.8)	29.4(2.0)
MITBRE	48.3(9.0)	16.1(5.3)	5.9(3.0)
MYOLAX	44.8(1.8)	35.5(4.5)	23.5(1.1)
PARFIM	6.9(.5)	6.5(.5)	.0(.0)
PEDBRA	6.9(.5)	3.2(3.0)	5.9(.5)
PEDCON	6.9(.5)	.0(.0)	.0(.0)
PENLYA	3.4(3.0)	.0(.0)	23.5(.5)
PENSTE	3.4(.5)	3.2(.5)	11.8(.5)
POLLON	24.1(.5)	16.1(.5)	23.5(.5)
POTARG	.0(.0)	.0(.0)	5.9(.5)
PTEAQU	3.4(10.0)	29.0(12.7)	23.5(5.9)
RANUNC	.0(.0)	3.2(.5)	.0(.0)
SEDUMX	.0(.0)	3.2(.5)	5.9(3.0)
SENINT	.0(.0)	3.2(.5)	11.8(5.3)
SENMEG	3.4(.5)	.0(.0)	.0(.0)
SENTRI	96.6(15.9)	87.1(3.1)	29.4(2.9)
SMIRAC	20.7(.5)	19.4(.5)	23.5(1.1)
SMISTE	20.7(7.8)	32.3(3.4)	17.6(4.5)
THAOCC	89.7(12.5)	93.5(12.6)	76.5(6.1)
URTDIO	13.8(3.5)	38.7(11.4)	.0(.0)
VALSIT	31.0(2.4)	16.1(1.5)	29.4(3.9)
VERVIR	86.2(6.9)	77.4(3.8)	23.5(.5)
VIOGLA	75.9(9.1)	61.3(9.9)	11.8(1.8)
WOODRE	.0(.0)	.0(.0)	.0(.0)
XERTEN	34.5(7.7)	35.5(2.7)	82.4(22.4)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	PACMYR/XERTEN N = 14	ACEGLA/RUBPAR N = 15	ACEGLA/SORSCO N = 26	ACEGLA/XERTEN N = 20	AMEALN/ACHMIL N = 26	VACGLO/XERTEN N = 31	VACSCO/XERTEN N = 7
***** TREES *****							
ABILAS	92.9(4.4)	53.3(6.7)	50.0(2.1)	80.0(4.4)	69.2(2.1)	96.8(3.2)	85.7(3.3)
LAROCC	.0(.0)	.0(.0)	17.9(.5)	10.0(.5)	3.8(3.0)	3.2(.5)	.0(.0)
PICENG	42.9(.5)	46.7(2.6)	32.1(.8)	60.0(1.7)	26.9(1.9)	32.3(1.0)	14.3(.5)
PINALB	71.4(1.7)	13.3(.5)	3.6(.5)	20.0(.5)	30.8(.5)	64.5(.9)	85.7(.5)
PINCON	7.1(3.0)	6.7(.5)	3.6(.5)	5.0(.5)	3.8(.5)	9.7(1.3)	14.3(.5)
PSEMEN	42.9(1.3)	26.7(1.8)	60.7(2.1)	55.0(2.5)	69.2(3.3)	16.1(2.0)	.0(.0)
***** SHRUBS *****							
ACEGLA	50.0(3.6)	93.3(32.9)	82.1(29.6)	90.0(14.7)	76.9(8.4)	12.9(2.9)	.0(.0)
ALNVIR	14.3(5.3)	66.7(11.5)	78.6(11.9)	75.0(5.2)	15.4(.5)	9.7(1.3)	.0(.0)
AMEALN	85.7(2.5)	33.3(5.3)	57.1(6.9)	80.0(9.1)	96.2(19.5)	45.2(2.8)	.0(.0)
BERREP	7.1(.5)	.0(.0)	21.4(.5)	25.0(.5)	53.8(1.4)	3.2(.5)	.0(.0)
CEAVEL	.0(.0)	.0(.0)	10.7(.5)	5.0(.5)	19.2(7.8)	3.2(.5)	.0(.0)
HOLDIS	.0(.0)	.0(.0)	14.3(1.1)	5.0(.5)	26.9(3.6)	.0(.0)	.0(.0)
JUNCOM	21.4(3.7)	.0(.0)	7.1(.5)	.0(.0)	19.2(.5)	19.4(.9)	.0(.0)
LONINV	.0(.0)	13.3(3.0)	7.1(1.8)	5.0(.5)	.0(.0)	.0(.0)	.0(.0)
LONUTA	14.3(.5)	6.7(.5)	28.6(1.1)	35.0(.9)	23.1(.9)	41.9(1.1)	.0(.0)
MENFER	7.1(3.0)	13.3(30.2)	17.9(3.9)	10.0(1.8)	.0(.0)	22.6(7.8)	.0(.0)
PACMYR	100.0(21.4)	20.0(2.2)	78.6(8.0)	90.0(8.4)	84.6(7.2)	48.4(8.7)	.0(.0)
PENFLO	7.1(3.0)	.0(.0)	.0(.0)	5.0(3.0)	.0(.0)	6.5(1.8)	28.6(.5)
PRUVIR	.0(.0)	6.7(.5)	14.3(6.0)	25.0(3.4)	30.8(15.7)	.0(.0)	.0(.0)
RHAALN	.0(.0)	13.3(11.5)	7.1(.5)	20.0(9.1)	11.5(3.0)	.0(.0)	.0(.0)
RIBLAC	.0(.0)	46.7(2.6)	60.7(.9)	45.0(.8)	3.8(.5)	12.9(.5)	.0(.0)
RIBVIS	28.6(.5)	.0(.0)	7.1(.5)	20.0(1.1)	3.8(.5)	.0(.0)	.0(.0)
ROSAXX	.0(.0)	6.7(.5)	3.6(.5)	10.0(.5)	19.2(1.5)	3.2(.5)	.0(.0)
RUBIDA	.0(.0)	6.7(.5)	7.1(.5)	5.0(.5)	.0(.0)	.0(.0)	.0(.0)
RUBPAR	35.7(3.9)	93.3(17.6)	100.0(11.6)	95.0(5.9)	30.8(1.8)	22.6(6.7)	.0(.0)
SALIXX	21.4(.5)	33.3(8.7)	32.1(4.3)	35.0(6.4)	3.8(.5)	6.5(1.8)	.0(.0)
SAMRAC	.0(.0)	66.7(4.1)	53.6(1.5)	25.0(1.0)	3.8(.5)	6.5(.5)	14.3(.5)
SORSCO	35.7(9.0)	86.7(6.4)	89.3(16.3)	85.0(11.7)	57.7(3.9)	67.7(5.4)	42.9(.5)
SPIBET	21.4(4.5)	26.7(3.5)	39.3(2.7)	55.0(3.2)	57.7(8.4)	35.5(3.4)	.0(.0)
SPIDEN	42.9(2.9)	40.0(4.1)	14.3(6.5)	35.0(7.6)	26.9(5.3)	45.2(4.9)	42.9(.5)
SYMALB	7.1(.5)	66.7(12.6)	57.1(6.3)	65.0(5.7)	38.5(4.1)	3.2(3.0)	.0(.0)
TAXBRE	7.1(3.0)	20.0(16.7)	57.1(11.6)	45.0(4.6)	3.8(20.0)	.0(.0)	.0(.0)
VACGLO	85.7(4.1)	40.0(5.8)	64.3(6.8)	90.0(11.9)	50.0(4.1)	100.0(18.9)	71.4(3.9)
VACSCO	42.9(4.9)	.0(.0)	7.1(.5)	5.0(3.0)	15.4(1.1)	87.1(10.2)	100.0(25.7)
***** GRASSES *****							
CALAMA	.0(.0)	.0(.0)	10.7(7.0)	5.0(10.0)	.0(.0)	.0(.0)	.0(.0)
CAREXX	85.7(12.2)	53.3(4.1)	50.0(3.1)	20.0(4.1)	46.2(12.0)	61.3(15.0)	42.9(16.3)
CARGEY	14.3(10.0)	.0(.0)	17.9(2.5)	65.0(8.2)	50.0(15.8)	32.3(8.3)	42.9(5.3)
GRASSP	35.7(6.4)	86.7(7.7)	67.9(6.5)	60.0(5.8)	57.7(9.1)	45.2(7.9)	28.6(11.5)
LUZGLA	.0(.0)	6.7(20.0)	.0(.0)	.0(.0)	3.8(.5)	25.8(5.1)	71.4(12.6)
***** FORBS *****							
ACHMIL	57.1(1.8)	6.7(.5)	21.4(.5)	50.0(1.5)	96.2(2.3)	32.3(1.8)	28.6(.5)
ACTRUB	.0(.0)	40.0(1.3)	35.7(1.9)	15.0(.5)	3.8(.5)	.0(.0)	.0(.0)
AGAURT	.0(.0)	.0(.0)	3.6(.5)	20.0(.5)	.0(.0)	3.2(.5)	.0(.0)

ANAMAR	7.1(.5)	6.7(.5)	7.1(.5)	20.0(1.1)	3.8(.5)	3.2(.5)	.0(.0)
ANGARG	.0(.0)	13.3(.5)	10.7(.5)	20.0(.5)	.0(.0)	.0(.0)	.0(.0)
ANTRAC	28.6(1.1)	.0(.0)	3.6(3.0)	10.0(1.8)	26.9(.9)	6.5(1.8)	.0(.0)
APOAND	14.3(5.3)	.0(.0)	3.6(.5)	20.0(3.0)	30.8(7.2)	3.2(10.0)	.0(.0)
APOCYN	.0(.0)	6.7(10.0)	14.3(6.6)	.0(.0)	19.2(5.8)	3.2(.5)	.0(.0)
ARECAP	21.4(3.7)	.0(.0)	.0(.0)	10.0(.5)	7.7(.5)	22.6(1.2)	28.6(.5)
ARNLAT	21.4(4.5)	20.0(3.7)	28.6(5.0)	40.0(4.4)	23.1(.9)	29.0(1.6)	28.6(.5)
ASTCON	21.4(2.2)	6.7(.5)	7.1(1.8)	20.0(4.1)	7.7(.5)	3.2(.5)	.0(.0)
ASTENG	28.6(3.5)	6.7(20.0)	7.1(3.0)	.0(.0)	3.8(3.0)	16.1(3.4)	.0(.0)
ASTERX	42.9(1.8)	13.3(.5)	25.0(5.7)	5.0(3.0)	26.9(4.0)	38.7(2.0)	14.3(.5)
ATHFIL	.0(.0)	86.7(5.9)	60.7(6.2)	10.0(.5)	.0(.0)	.0(.0)	.0(.0)
BALSAG	14.3(1.8)	.0(.0)	.0(.0)	5.0(.5)	38.5(2.4)	3.2(.5)	.0(.0)
CALAPI	35.7(1.5)	.0(.0)	.0(.0)	5.0(.5)	19.2(1.0)	9.7(.5)	28.6(.5)
CAMROT	14.3(.5)	.0(.0)	10.7(.5)	25.0(1.0)	26.9(.5)	9.7(.5)	14.3(.5)
CASTIL	42.9(2.9)	13.3(.5)	10.7(2.2)	40.0(.8)	65.4(1.8)	32.3(.5)	14.3(.5)
CIRALP	.0(.0)	40.0(4.2)	14.3(4.1)	5.0(.5)	.0(.0)	.0(.0)	.0(.0)
CIRSIU	7.1(.5)	6.7(.5)	14.3(.5)	25.0(.5)	3.8(.5)	6.5(.5)	14.3(.5)
CLIUNI	14.3(5.3)	40.0(2.9)	82.1(5.1)	35.0(6.3)	7.7(.5)	16.1(1.5)	.0(.0)
DISHOO	.0(.0)	66.7(10.6)	42.9(5.3)	10.0(1.8)	3.8(.5)	.0(.0)	.0(.0)
EPIANG	85.7(9.0)	80.0(10.8)	78.6(8.3)	90.0(8.8)	53.8(4.3)	80.6(3.5)	42.9(.5)
ERIFLA	42.9(6.2)	.0(.0)	.0(.0)	5.0(.5)	34.6(2.6)	19.4(7.5)	28.6(5.3)
ERIGER	28.6(1.1)	33.3(15.9)	10.7(.5)	30.0(2.2)	19.2(.5)	25.8(.8)	57.1(1.1)
ERIPER	14.3(3.0)	.0(.0)	21.4(1.3)	20.0(3.0)	11.5(1.3)	16.1(1.0)	.0(.0)
ERYGRA	21.4(1.3)	6.7(.5)	14.3(1.1)	10.0(1.8)	23.1(1.8)	41.9(5.2)	85.7(6.6)
FRAVIR	57.1(1.1)	20.0(1.3)	28.6(.5)	65.0(3.7)	53.8(1.4)	22.6(1.2)	14.3(.5)
GALTRI	.0(.0)	66.7(1.3)	46.4(1.8)	30.0(1.3)	.0(.0)	3.2(.5)	.0(.0)
GYMDRY	.0(.0)	6.7(3.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
HERSPH	.0(.0)	86.7(6.0)	28.6(2.3)	25.0(1.5)	3.8(3.0)	.0(.0)	.0(.0)
HEUCYL	57.1(.8)	6.7(.5)	21.4(.5)	30.0(.5)	76.9(2.9)	32.3(1.5)	.0(.0)
LOMDIS	35.7(1.0)	6.7(3.0)	.0(.0)	15.0(.5)	15.4(.5)	3.2(.5)	42.9(.5)
MITBRE	.0(.0)	40.0(1.8)	14.3(6.5)	.0(.0)	.0(.0)	9.7(.5)	14.3(.5)
MYOLAX	7.1(.5)	.0(.0)	7.1(1.8)	5.0(.5)	3.8(.5)	.0(.0)	.0(.0)
OSMDEP	.0(.0)	.0(.0)	3.6(.5)	5.0(.5)	.0(.0)	.0(.0)	.0(.0)
PEDCON	7.1(3.0)	6.7(.5)	.0(.0)	.0(.0)	3.8(.5)	9.7(4.5)	14.3(3.0)
PENLYA	28.6(.5)	.0(.0)	.0(.0)	.0(.0)	26.9(.5)	25.3(10.3)	14.3(20.0)
PENSTE	7.1(.5)	6.7(.5)	3.6(.5)	10.0(1.8)	19.2(2.0)	9.7(.5)	.0(.0)
POLCON	7.1(.5)	26.7(.5)	53.6(.7)	15.0(.5)	7.7(.5)	3.2(.5)	.0(.0)
PTEAQU	.0(.0)	46.7(8.5)	10.7(4.5)	25.0(2.9)	15.4(2.4)	.0(.0)	.0(.0)
SEDUMX	21.4(.5)	.0(.0)	.0(.0)	5.0(.5)	46.2(.7)	9.7(.5)	.0(.0)
SENTRI	21.4(1.3)	66.7(8.3)	64.3(3.5)	35.0(.9)	7.7(.5)	22.6(1.6)	14.3(.5)
SMIRAC	14.3(1.8)	20.0(4.5)	39.3(4.5)	40.0(.5)	26.9(.9)	9.7(.5)	.0(.0)
SMISTE	7.1(.5)	60.0(6.7)	57.1(8.3)	35.0(2.9)	11.5(.5)	.0(.0)	.0(.0)
STRAMP	.0(.0)	20.0(.5)	3.6(.5)	5.0(.5)	.0(.0)	.0(.0)	.0(.0)
THAOCC	50.0(.9)	80.0(7.1)	92.9(6.4)	95.0(3.7)	30.8(4.1)	43.4(2.9)	.0(.0)
TIATRI	.0(.0)	20.0(2.2)	3.6(10.0)	5.0(3.0)	.0(.0)	.0(.0)	.0(.0)
TRIOVA	.0(.0)	6.7(.5)	7.1(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
URTDIO	.0(.0)	66.7(6.1)	32.1(4.3)	15.0(.5)	3.8(.5)	.0(.0)	.0(.0)
VALSIT	21.4(1.3)	6.7(.5)	3.6(.5)	15.0(1.3)	3.8(.5)	38.7(1.1)	42.9(1.3)
VERVIR	14.3(.5)	86.7(.9)	50.0(1.6)	35.0(.5)	3.8(10.0)	22.6(2.2)	14.3(10.0)
VIOGLA	.0(.0)	80.0(8.1)	60.7(5.5)	15.0(1.3)	.0(.0)	3.2(.5)	.0(.0)
WOODRE	.0(.0)	.0(.0)	3.6(.5)	.0(.0)	7.7(1.3)	9.7(.5)	14.3(.5)
XERTEN	92.9(24.9)	53.3(5.1)	75.0(11.5)	100.0(26.5)	76.9(18.4)	100.0(44.2)	100.0(45.7)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	POTFRU/GRAMXX N = 4	ALNSIN/VIOGLA N = 44	ALNSIN/ATHFIL N = 57
***** TREES *****			
ABILAS	100.0(2.9)	61.4(1.9)	61.4(4.6)
LAROCC	.0(.0)	2.3(3.0)	1.8(.5)
PICENG	.0(.0)	50.0(.8)	45.6(1.7)
PINALB	50.0(.5)	.0(.0)	5.3(.5)
PINCON	.0(.0)	2.3(.5)	1.8(.5)
PSEMEN	.0(.0)	4.5(.5)	21.1(1.3)
***** SHRUBS *****			
ACEGLA	.0(.0)	31.8(7.2)	49.1(8.2)
ALNVIR	.0(.0)	97.7(58.8)	100.0(66.7)
AMEALN	.0(.0)	6.8(3.7)	5.3(3.7)
BERREP	.0(.0)	.0(.0)	.0(.0)
CEAVEL	.0(.0)	2.3(.5)	.0(.0)
HOLDIS	.0(.0)	.0(.0)	.0(.0)
JUNCOM	25.0(10.0)	.0(.0)	.0(.0)
LONINV	.0(.0)	18.2(1.8)	10.5(1.3)
LONUTA	.0(.0)	9.1(.5)	8.8(.5)
MENFER	.0(.0)	45.5(4.3)	49.1(6.4)
PACMYR	25.0(.5)	13.6(3.7)	24.6(1.0)
PENFLO	100.0(32.5)	.0(.0)	.0(.0)
PRUVIR	.0(.0)	2.3(.5)	.0(.0)
RHAALN	.0(.0)	2.3(.5)	3.5(1.8)
RIBLAC	.0(.0)	54.5(.9)	61.4(2.2)
RIBVIS	.0(.0)	.0(.0)	.0(.0)
ROSAXX	.0(.0)	2.3(.5)	.0(.0)
RUBIDA	.0(.0)	6.8(.5)	5.3(.5)
RUBPAR	25.0(.5)	75.0(6.0)	82.5(6.8)
SALIXX	25.0(20.0)	4.5(5.3)	12.3(1.9)
SAMRAC	.0(.0)	65.9(2.6)	80.7(3.1)
SORSCO	.0(.0)	77.3(9.4)	80.7(7.9)
SPIBET	25.0(3.0)	18.2(4.2)	3.5(.5)
SPIDEN	50.0(1.8)	45.5(4.8)	52.6(4.2)
SYMALB	.0(.0)	15.9(1.6)	17.5(2.2)
TAXBRE	.0(.0)	6.8(1.3)	14.0(1.8)
VACGLO	.0(.0)	52.3(5.7)	57.9(2.9)
VACSCO	.0(.0)	.0(.0)	1.8(.5)
***** GRASSES *****			
CALAMA	.0(.0)	6.8(21.0)	8.8(13.3)
CAREXX	50.0(11.5)	25.0(3.4)	52.6(5.9)
CARGEY	.0(.0)	13.6(5.7)	8.8(2.5)
GRASSP	100.0(13.4)	75.0(5.1)	82.5(5.2)
LUZGLA	.0(.0)	20.5(7.0)	15.8(1.9)
***** FORBS *****			
ACHMIL	75.0(8.7)	2.3(.5)	5.3(.5)
ACTRUB	.0(.0)	31.8(3.0)	47.4(1.6)
AGAURT	.0(.0)	9.1(.5)	3.5(.5)

ANAMAR	.0(.0)	4.5(.5)	12.3(.5)
ANGARG	.0(.0)	2.3(.5)	3.5(.5)
ANTRAC	25.0(10.0)	.0(.0)	1.8(3.0)
APOAND	.0(.0)	.0(.0)	.0(.0)
APOCYN	.0(.0)	.0(.0)	.0(.0)
ARECAP	50.0(3.0)	.0(.0)	.0(.0)
ARNLAT	75.0(14.3)	29.5(2.4)	12.3(2.3)
ASTCON	25.0(10.0)	4.5(1.8)	5.3(.5)
ASTENG	.0(.0)	.0(.0)	1.8(3.0)
ASTERX	25.0(20.0)	4.5(1.8)	1.8(3.0)
ATHFIL	.0(.0)	52.3(5.5)	94.7(28.9)
BALSAG	.0(.0)	2.3(.5)	.0(.0)
CALAPI	.0(.0)	.0(.0)	.0(.0)
CAMROT	25.0(.5)	.0(.0)	1.8(.5)
CASTIL	50.0(1.8)	2.3(.5)	5.3(.5)
CIRALP	.0(.0)	18.2(6.5)	38.6(5.1)
CIRSIU	.0(.0)	.0(.0)	7.0(1.1)
CLIUNI	.0(.0)	52.3(5.4)	50.9(5.2)
DISHOO	.0(.0)	27.3(8.3)	31.6(7.2)
EPIANG	25.0(.5)	56.8(5.8)	56.1(5.4)
ERIFLA	50.0(1.8)	.0(.0)	.0(.0)
ERIGER	50.0(1.8)	4.5(1.8)	8.8(1.5)
ERIPER	25.0(.5)	9.1(1.1)	5.3(.5)
ERYGRA	50.0(3.0)	18.2(2.4)	14.0(2.6)
FRAVIR	.0(.0)	9.1(.5)	1.8(.5)
GALTRI	.0(.0)	34.1(1.8)	57.9(1.8)
GYMDRY	.0(.0)	9.1(5.3)	22.8(5.9)
HERSPH	.0(.0)	59.1(1.6)	70.2(2.2)
HEUCYL	50.0(10.0)	.0(.0)	1.8(.5)
LOMDIS	.0(.0)	.0(.0)	.0(.0)
MITBRE	.0(.0)	47.7(11.0)	73.7(8.9)
MYOLAX	.0(.0)	13.6(.5)	10.5(.5)
OSMDEP	.0(.0)	2.3(.5)	15.8(.8)
PEDCON	25.0(.5)	2.3(.5)	1.8(.5)
PENLYA	.0(.0)	.0(.0)	.0(.0)
PENSTE	50.0(3.0)	.0(.0)	.0(.0)
POLLON	.0(.0)	18.2(.5)	29.8(.5)
PTEAQU	.0(.0)	18.2(15.2)	12.3(8.2)
SEDUMX	50.0(.5)	.0(.0)	.0(.0)
SENTRI	25.0(10.0)	77.3(12.4)	94.7(6.9)
SMIRAC	.0(.0)	13.6(.5)	5.3(1.3)
SMISTE	.0(.0)	59.1(12.8)	64.9(11.1)
STRAMP	.0(.0)	6.8(.5)	19.3(.7)
THAOCC	25.0(.5)	84.1(11.5)	73.7(6.3)
TIATRI	.0(.0)	11.4(1.5)	29.8(2.5)
TRIOVA	.0(.0)	9.1(.5)	12.3(.5)
URTDIO	.0(.0)	20.5(.8)	33.3(3.0)
VALSIT	25.0(.5)	4.5(.5)	.0(.0)
VERVIR	.0(.0)	84.1(6.9)	78.9(4.7)
VIOGLA	.0(.0)	77.3(18.5)	93.0(13.0)
WOODRE	.0(.0)	2.3(.5)	5.3(.5)
XERTEN	50.0(.5)	40.9(1.7)	31.6(2.0)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	* ALNSIN/XERTEN * N = 2	* ALNSIN/OPLHOR * N = 3	* ALNSIN/MENFER * N = 10	* ERYGRA/LUZHIT * N = 13	* SENTRI/ARNLAT * N = 65	* SENTRI/EPIANG * N = 20	* PSEMEN/VACGLO * N = 25
***** TREES *****							
ABILAS	.0(.0)	50.0(1.1)	100.0(2.2)	92.3(2.3)	93.8(5.1)	60.0(3.5)	68.0(2.1)
BETPAP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
LAROCC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.0(.5)	24.0(2.5)
PICENG	.0(.0)	62.5(.5)	70.0(2.2)	7.7(.5)	44.6(2.3)	35.0(.9)	32.0(1.1)
PINALB	.0(.0)	.0(.0)	10.0(.5)	53.8(.5)	29.2(.5)	15.0(.5)	24.0(4.6)
PINCON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	32.0(8.4)
PINMON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.0(.5)
POPTRE	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
POPTRI	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
PSEMEN	.0(.0)	.0(.0)	10.0(.5)	.0(.0)	.0(.0)	.0(.0)	100.0(17.6)
***** SHRUBS *****							
ACEGLA	.0(.0)	62.5(6.3)	30.0(1.3)	.0(.0)	1.5(.5)	20.0(.5)	72.0(3.0)
ALNVIR	100.0(35.0)	100.0(61.2)	100.0(53.0)	.0(.0)	15.4(3.4)	30.0(5.3)	4.0(.5)
AMEALN	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	15.0(.5)	92.0(7.0)
BERREP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	44.0(.5)
CEAVEL	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	16.0(6.0)
CORSTO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.0(.5)	.0(.0)
HOLDIS	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.0(.5)
JUNCOM	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	20.0(.5)
LINBOR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
LONINV	.0(.0)	.0(.0)	.0(.0)	.0(.0)	18.5(1.3)	30.0(.5)	.0(.0)
LONUTA	.0(.0)	37.5(.5)	40.0(.5)	.0(.0)	4.6(4.5)	.0(.0)	68.0(.8)
MENFER	.0(.0)	87.5(7.6)	100.0(41.0)	23.1(.5)	40.0(3.0)	10.0(.5)	8.0(.5)
OPLHOR	.0(.0)	100.0(35.0)	10.0(3.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
PACMYR	100.0(1.5)	.0(.0)	20.0(1.8)	.0(.0)	.0(.0)	.0(.0)	96.0(15.1)
PRUVIR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
RHAALN	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
RIBESX	.0(.0)	.0(.0)	10.0(.5)	.0(.0)	1.5(.5)	.0(.0)	.0(.0)
RIBLAC	.0(.0)	62.5(1.5)	50.0(2.9)	.0(.0)	15.4(.8)	25.0(.5)	16.0(.5)
RIBVIS	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.0(.5)
ROSAXX	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.0(.5)
RUBIDA	.0(.0)	12.5(.5)	.0(.0)	.0(.0)	.0(.0)	5.0(3.0)	.0(.0)
RUBPAR	.0(.0)	100.0(4.8)	70.0(3.6)	.0(.0)	4.6(5.3)	60.0(6.1)	48.0(1.3)
SALIXX	.0(.0)	.0(.0)	10.0(.5)	.0(.0)	6.2(1.3)	5.0(.5)	28.0(1.9)
SALSCO	.0(.0)	.0(.0)	10.0(10.0)	.0(.0)	.0(.0)	5.0(3.0)	.0(.0)
SAMRAC	.0(.0)	100.0(2.6)	90.0(1.6)	.0(.0)	32.3(1.2)	60.0(3.7)	4.0(.5)
SORSCO	50.0(10.0)	62.5(7.3)	70.0(10.1)	.0(.0)	16.9(1.4)	55.0(2.7)	28.0(1.7)
SPIBET	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(.5)	5.0(10.0)	64.0(5.3)
SPIDEN	50.0(3.0)	12.5(.5)	60.0(4.5)	30.8(2.9)	33.8(2.1)	30.0(1.8)	8.0(5.3)
SYMALB	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	20.0(2.4)	20.0(1.0)
TAXBRE	.0(.0)	12.5(10.0)	10.0(.5)	.0(.0)	.0(.0)	.0(.0)	12.0(2.2)
VACGLO	100.0(15.2)	25.0(1.8)	90.0(9.6)	38.5(2.0)	44.6(1.9)	20.0(4.1)	96.0(17.0)
VACSCO	50.0(.5)	.0(.0)	.0(.0)	53.8(5.3)	33.8(2.4)	10.0(.5)	44.0(6.7)
***** GRASSES *****							
CALAMA	.0(.0)	.0(.0)	10.0(.5)	.0(.0)	.0(.0)	5.0(3.0)	.0(.0)
CALRUB	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	20.0(7.8)

CAREXX	.0(.0)	25.0(1.8)	30.0(7.7)	53.8(16.6)	66.2(10.4)	40.0(3.3)	44.0(6.0)
CARGEY	.0(.0)	.0(.0)	10.0(.5)	30.8(7.6)	15.4(5.4)	20.0(10.9)	56.0(6.1)
GRASSP	50.0(.5)	100.0(3.8)	60.0(3.0)	61.5(3.3)	81.5(8.5)	65.0(10.4)	48.0(4.9)
LUZGLA	.0(.0)	.0(.0)	30.0(8.7)	92.3(20.3)	84.6(12.6)	20.0(6.5)	.0(.0)
PSESPI	.0(.0)	.0(.0)	.0(.0)	.0(.0)	6.2(15.0)	.0(.0)	.0(.0)
***** FORES *****							
ACHMIL	.0(.0)	.0(.0)	.0(.0)	23.1(.5)	3.1(.5)	20.0(.5)	48.0(.9)
ACTRUB	.0(.0)	75.0(2.5)	30.0(.5)	.0(.0)	3.1(.5)	35.0(.5)	4.0(.5)
ADEPIC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
ANAMAR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(.5)	15.0(.5)	4.0(.5)
ANEGCC	.0(.0)	.0(.0)	.0(.0)	76.9(5.1)	41.5(4.1)	.0(.0)	.0(.0)
ANGARG	.0(.0)	.0(.0)	.0(.0)	.0(.0)	10.8(.5)	10.0(.5)	.0(.0)
ANTRAC	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	.0(.0)	.0(.0)	44.0(1.9)
APOAND	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	12.0(3.7)
APOCYN	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.0(.5)
AQUFLA	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	10.8(.9)	10.0(.5)	.0(.0)
ARANUD	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.0(.5)	.0(.0)
ARNLAT	.0(.0)	25.0(1.8)	30.0(3.0)	53.8(9.5)	83.1(16.5)	15.0(2.2)	36.0(1.1)
ASTCON	.0(.0)	.0(.0)	.0(.0)	7.7(3.0)	1.5(10.0)	15.0(11.0)	32.0(2.3)
ASTENG	.0(.0)	.0(.0)	10.0(.5)	.0(.0)	.0(.0)	15.0(13.3)	16.0(4.1)
ASTERX	.0(.0)	.0(.0)	10.0(.5)	30.8(3.5)	23.1(5.7)	25.0(12.8)	24.0(.9)
ATHFIL	.0(.0)	100.0(28.7)	70.0(7.1)	.0(.0)	4.6(1.3)	5.0(.5)	.0(.0)
CALAPI	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	.0(.0)	.0(.0)	24.0(.5)
CAMROT	.0(.0)	.0(.0)	.0(.0)	.0(.0)	3.1(.5)	.0(.0)	4.0(.5)
CASTIL	.0(.0)	.0(.0)	.0(.0)	84.6(1.4)	50.8(2.1)	25.0(6.3)	16.0(1.1)
CHIUMB	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.0(.5)
CIRSIU	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(.5)	15.0(.5)	.0(.0)
CLAFLA	.0(.0)	.0(.0)	.0(.0)	76.9(5.1)	12.3(2.4)	.0(.0)	.0(.0)
CLIUNI	50.0(.5)	62.5(1.0)	40.0(10.2)	.0(.0)	3.1(.5)	20.0(2.9)	8.0(1.8)
DISHOO	.0(.0)	37.5(7.0)	10.0(3.0)	.0(.0)	.0(.0)	10.0(1.8)	.0(.0)
EPIANG	50.0(10.0)	12.5(10.0)	50.0(2.9)	30.8(1.1)	67.7(4.9)	95.0(18.7)	76.0(2.8)
EQUARV	.0(.0)	.0(.0)	.0(.0)	.0(.0)	13.8(1.1)	10.0(35.2)	.0(.0)
ERIGER	.0(.0)	12.5(10.0)	10.0(.5)	15.4(3.0)	38.5(6.9)	40.0(13.6)	20.0(.5)
ERIPER	.0(.0)	.0(.0)	.0(.0)	23.1(2.2)	27.7(4.6)	10.0(1.8)	8.0(.5)
ERYGRA	.0(.0)	.0(.0)	.0(.0)	92.3(15.5)	64.6(7.0)	20.0(2.4)	28.0(2.6)
FRAVIR	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	9.2(9.4)	.0(.0)	36.0(1.3)
GALTRI	.0(.0)	100.0(1.1)	60.0(1.3)	.0(.0)	20.0(2.2)	25.0(1.5)	.0(.0)
GOOOBL	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
GYMDRY	.0(.0)	75.0(7.8)	20.0(6.5)	.0(.0)	.0(.0)	5.0(.5)	.0(.0)
HERSPH	.0(.0)	75.0(2.1)	30.0(.5)	.0(.0)	41.5(2.7)	55.0(4.0)	.0(.0)
HEUCYL	.0(.0)	.0(.0)	.0(.0)	23.1(.5)	3.1(3.0)	10.0(1.8)	36.0(2.1)
LIGUST	.0(.0)	25.0(.5)	.0(.0)	.0(.0)	3.1(1.8)	.0(.0)	.0(.0)
LOMDIS	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(3.0)	20.0(2.4)	8.0(.5)
LUPINU	.0(.0)	.0(.0)	.0(.0)	7.7(3.0)	3.1(.5)	10.0(5.3)	8.0(.5)
MIMLEW	.0(.0)	12.5(.5)	.0(.0)	.0(.0)	20.0(1.5)	.0(.0)	.0(.0)
MITBRE	.0(.0)	87.5(13.7)	100.0(5.1)	7.7(.5)	44.6(7.0)	30.0(5.8)	4.0(10.0)
PARFIM	.0(.0)	.0(.0)	.0(.0)	.0(.0)	35.4(2.5)	5.0(3.0)	.0(.0)
PEDERA	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	29.2(1.2)	.0(.0)	4.0(.5)
PEDCON	.0(.0)	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	.0(.0)	12.0(1.3)
POLLON	.0(.0)	62.5(.5)	40.0(.5)	7.7(.5)	15.4(.5)	.0(.0)	.0(.0)
PTEAQU	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(.5)	20.0(20.7)	4.0(.5)
PYRASA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.5(.5)	.0(.0)	.0(.0)
RANUNC	.0(.0)	.0(.0)	.0(.0)	53.8(6.3)	24.6(3.4)	.0(.0)	.0(.0)
SAXIFR	.0(.0)	.0(.0)	.0(.0)	7.7(.5)	13.8(2.2)	.0(.0)	.0(.0)
SAXODO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	15.4(1.3)	.0(.0)	.0(.0)
SEDUMX	.0(.0)	.0(.0)	.0(.0)	15.4(1.8)	.0(.0)	.0(.0)	8.0(.5)

SENTRI	.0(.0)	100.0(5.6)	100.0(5.4)	53.8(1.6)	100.0(26.6)	90.0(17.9)	4.0(3.0)
SMIRAC	.0(.0)	.0(.0)	40.0(.5)	.0(.0)	.0(.0)	15.0(.5)	.0(.0)
SMISTE	.0(.0)	37.5(3.7)	30.0(6.8)	.0(.0)	.0(.0)	25.0(1.5)	16.0(5.4)
STRAMP	.0(.0)	87.5(.9)	10.0(.5)	.0(.0)	4.6(.5)	.0(.0)	.0(.0)
TAROFF	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.0(.5)	.0(.0)
THAGOC	.0(.0)	37.5(1.3)	60.0(5.3)	30.8(1.1)	50.8(6.7)	80.0(10.7)	40.0(1.7)
TIATRI	.0(.0)	100.0(6.7)	20.0(3.0)	.0(.0)	4.6(3.0)	.0(.0)	.0(.0)
TRIOVA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
URTDIO	.0(.0)	12.5(3.0)	20.0(3.0)	.0(.0)	.0(.0)	30.0(6.1)	4.0(.5)
VALSIT	50.0(.5)	.0(.0)	10.0(.5)	69.2(2.9)	84.6(5.5)	40.0(2.6)	12.0(.5)
VERVIR	.0(.0)	50.0(2.4)	60.0(1.3)	46.2(.9)	80.2(10.9)	65.0(8.7)	4.0(3.0)
VIOGLA	.0(.0)	100.0(6.6)	70.0(5.6)	7.7(.5)	21.5(5.6)	40.0(10.5)	4.0(10.0)
VIOORE	.0(.0)	.0(.0)	10.0(3.0)	.0(.0)	1.5(.6)	.0(.0)	.0(.0)
XERTEN	100.0(15.0)	.0(.0)	50.0(6.6)	61.5(6.1)	35.4(3.2)	60.0(9.2)	96.0(27.6)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	PSME/VAGL/XETE N = 39	PSME/SYAL 1 N = 10	PSME/SYAL 2 N = 6	ABLA/CLUN/ARNU N = 1	RUBPAR/EPIANG N = 23	PACMYR/EPIANG N = 17	ACEGLA/EPIANG N = 52
***** TREES *****							
ABILAS	61.5(3.9)	30.0(.5)	.0(.0)	100.0(3.0)	91.3(11.0)	82.4(5.4)	92.3(7.0)
BETPAP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	41.2(1.9)	3.8(.5)
LAROCC	41.0(5.7)	50.0(4.9)	.0(.0)	100.0(10.0)	26.1(2.9)	88.2(3.2)	61.5(2.3)
PICENG	46.2(6.2)	50.0(2.5)	16.7(3.0)	100.0(30.0)	87.0(8.9)	88.2(6.0)	92.3(5.6)
PINALB	15.4(.5)	10.0(.5)	.0(.0)	.0(.0)	8.7(.5)	5.9(.5)	3.8(.5)
PINCON	43.6(10.1)	40.0(1.1)	.0(.0)	.0(.0)	26.1(.9)	47.1(3.2)	23.1(1.3)
PINMON	5.1(.5)	10.0(.5)	.0(.0)	.0(.0)	8.7(.5)	47.1(.8)	13.5(1.9)
POPTRE	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	41.2(.5)	1.9(.5)
POPTRI	.0(.0)	30.0(.5)	.0(.0)	.0(.0)	43.5(2.4)	64.7(1.4)	50.0(2.6)
PSEMEN	100.0(37.8)	100.0(17.6)	100.0(53.3)	100.0(10.0)	8.7(3.0)	41.2(3.9)	55.8(2.8)
***** SHRUBS *****							
ACEGLA	59.7(8.1)	100.0(7.3)	83.3(16.6)	100.0(20.0)	69.6(1.9)	88.2(6.7)	92.3(17.6)
ALNVIR	25.6(1.7)	20.0(.5)	16.7(.5)	100.0(.5)	87.0(7.3)	76.5(4.3)	82.7(12.5)
AMEALN	79.5(6.3)	80.0(12.6)	83.3(11.2)	.0(.0)	13.0(1.3)	64.7(6.6)	40.4(8.5)
BERREP	35.9(1.7)	70.0(1.6)	100.0(2.2)	.0(.0)	.0(.0)	11.8(.5)	1.9(.5)
CEAVEL	30.8(1.3)	60.0(2.2)	33.3(.5)	.0(.0)	.0(.0)	11.8(.5)	7.7(5.9)
CORSTO	.0(.0)	.0(.0)	.0(.0)	100.0(3.0)	13.0(3.7)	29.4(4.4)	28.8(1.6)
HOLDIS	33.3(2.9)	50.0(2.9)	83.3(8.7)	.0(.0)	.0(.0)	11.8(.5)	11.5(4.5)
JUNCOM	7.7(.5)	50.0(1.0)	16.7(.5)	.0(.0)	4.3(.5)	5.9(.5)	.0(.0)
LINBOR	.0(.0)	10.0(.5)	.0(.0)	100.0(3.0)	.0(.0)	11.8(1.8)	1.9(10.0)
LONINV	.0(.0)	20.0(.5)	.0(.0)	.0(.0)	34.8(4.7)	23.5(.5)	21.2(1.4)
LONUTA	46.2(1.6)	20.0(1.8)	16.7(.5)	.0(.0)	47.8(1.8)	58.8(.8)	65.4(1.6)
MENFER	15.4(.9)	10.0(.5)	.0(.0)	100.0(3.0)	65.2(6.9)	17.6(.5)	53.8(6.3)
OPLHOR	.0(.0)	.0(.0)	.0(.0)	100.0(.5)	.0(.0)	.0(.0)	15.4(2.6)
PACMYR	97.4(13.7)	100.0(10.7)	50.0(.5)	100.0(.5)	52.2(4.9)	94.1(9.0)	84.6(7.1)
PRUVIR	17.9(1.9)	50.0(3.4)	83.3(4.8)	.0(.0)	.0(.0)	11.8(1.8)	5.8(7.0)
RHAALN	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	8.7(1.8)	17.6(1.3)	5.8(.5)
RIBESX	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.9(.5)	5.8(.5)
RIBLAC	17.9(.5)	.0(.0)	.0(.0)	100.0(.5)	69.6(1.6)	29.4(.5)	65.4(.8)
RIEVIS	25.6(.5)	10.0(.5)	.0(.0)	.0(.0)	17.4(5.3)	11.8(1.8)	26.9(.7)
ROSAXX	17.9(2.9)	30.0(.5)	66.7(1.1)	.0(.0)	4.3(.5)	17.6(.5)	28.8(1.0)
RUBIDA	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	29.4(.5)	21.2(.5)
RUBPAR	69.2(3.7)	60.0(.9)	16.7(.5)	100.0(20.0)	95.7(20.1)	88.2(2.6)	98.1(12.2)
SALIXX	30.8(1.1)	40.0(1.1)	16.7(.5)	.0(.0)	26.1(.9)	35.3(.9)	25.8(1.0)
SALSCO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.3(3.0)	5.9(.5)	7.7(1.8)
SAMRAC	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	82.6(4.8)	41.2(1.2)	55.8(3.2)
SORSCO	69.2(3.4)	90.0(2.4)	16.7(10.0)	.0(.0)	60.9(1.5)	47.1(3.2)	75.0(4.9)
SPIBET	56.4(6.5)	60.0(8.8)	50.0(6.6)	100.0(.5)	.0(.0)	41.2(3.6)	30.8(3.8)
SPIDEN	12.8(2.5)	30.0(2.2)	.0(.0)	.0(.0)	47.8(6.4)	23.5(4.1)	44.2(2.1)
SYMALB	23.1(4.1)	80.0(7.8)	83.3(12.0)	100.0(3.0)	8.7(.5)	76.5(20.5)	36.5(2.6)
TAXBRE	20.5(3.6)	.0(.0)	.0(.0)	100.0(.5)	8.7(5.3)	29.4(1.5)	63.5(7.9)
VACGLO	92.3(15.3)	80.0(2.3)	.0(.0)	100.0(10.0)	73.9(5.8)	52.9(1.9)	86.5(7.7)
VACSCO	10.3(5.9)	.0(.0)	.0(.0)	.0(.0)	4.3(10.0)	5.9(.5)	.0(.0)
***** GRASSES *****							
CALANA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	17.4(13.4)	11.8(5.3)	17.3(11.1)
CALRUB	33.3(12.3)	10.0(20.0)	33.3(6.5)	.0(.0)	.0(.0)	11.8(10.0)	1.9(.5)

CAREXX	25.6(4.6)	30.0(6.8)	33.3(6.5)	.0(.0)	65.2(10.3)	41.2(8.5)	34.6(6.0)
CARGEY	48.7(6.4)	60.0(11.0)	66.7(4.6)	.0(.0)	30.4(12.3)	47.1(7.8)	50.0(8.7)
GRASSP	46.2(3.4)	50.0(4.8)	50.0(2.2)	100.0(.5)	73.9(16.0)	52.9(9.6)	69.2(10.6)
LUZGLA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	21.7(2.0)	.0(.0)	1.9(3.0)
PSESPI	15.4(3.0)	20.0(25.0)	16.7(.5)	.0(.0)	.0(.0)	.0(.0)	1.9(.5)
***** FORBS *****							
ACHMIL	41.0(1.1)	70.0(.9)	50.0(.5)	.0(.0)	4.3(.5)	5.9(.5)	19.2(.5)
ACTRUB	2.6(.5)	.0(.0)	.0(.0)	100.0(.5)	21.7(.5)	11.8(.5)	34.6(.6)
ADEBIC	.0(.0)	10.0(.5)	16.7(.5)	.0(.0)	.0(.0)	.0(.0)	15.4(.5)
ANAMAR	.0(.0)	20.0(1.8)	.0(.0)	.0(.0)	73.9(2.9)	35.3(1.3)	51.9(1.4)
ANEOCC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
ANGARG	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.8(.5)
ANTRAC	41.0(4.3)	10.0(.5)	50.0(11.2)	.0(.0)	.0(.0)	.0(.0)	3.8(.5)
APOAND	10.3(3.5)	10.0(3.0)	33.3(.5)	.0(.0)	.0(.0)	.0(.0)	3.8(1.8)
APOCYN	7.7(1.3)	10.0(3.0)	16.7(3.0)	.0(.0)	.0(.0)	5.9(.5)	5.8(5.3)
AQUFLA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
ARAHUD	.0(.0)	.0(.0)	.0(.0)	100.0(3.0)	.0(.0)	23.5(1.1)	5.8(.5)
ARNLAT	51.3(3.5)	10.0(.5)	.0(.0)	100.0(3.0)	56.5(4.5)	11.8(6.5)	67.3(4.5)
ASTCON	17.9(.5)	40.0(3.5)	33.3(.5)	.0(.0)	.0(.0)	23.5(.5)	3.8(.5)
ASTENG	7.7(2.2)	.0(.0)	.0(.0)	.0(.0)	4.3(20.0)	5.9(3.0)	.0(.0)
ASTERX	28.2(3.3)	10.0(.5)	16.7(.5)	100.0(.5)	13.0(.5)	17.6(.5)	9.6(1.5)
ATHFIL	5.1(1.5)	.0(.0)	.0(.0)	100.0(10.0)	69.6(1.3)	29.4(2.4)	63.5(3.9)
CALAPI	23.1(1.1)	.0(.0)	.0(.0)	.0(.5)	4.3(.5)	.0(.0)	1.9(.5)
CAMROT	7.7(.5)	10.0(.5)	33.3(.5)	.0(.0)	.0(.0)	.0(.0)	1.9(.5)
CASTIL	12.8(1.0)	.0(.0)	.0(.0)	.0(.0)	13.0(.5)	11.8(.5)	3.8(.5)
CHIUMB	20.5(.8)	.0(.0)	.0(.0)	100.0(.5)	.0(.0)	.0(.0)	.0(.0)
CIRSIU	.0(.0)	10.0(.5)	.0(.0)	.0(.0)	56.5(1.6)	58.8(1.0)	38.5(.6)
CLAFLA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
CLIUNI	41.0(5.9)	30.0(1.3)	33.3(.5)	100.0(3.0)	60.9(1.0)	76.5(3.8)	82.7(3.3)
DISHOO	20.5(.8)	10.0(.5)	33.3(.5)	100.0(3.0)	8.7(.5)	41.2(1.2)	15.4(.8)
EPIANG	64.1(2.3)	40.0(20.7)	83.3(.5)	.0(.0)	100.0(23.5)	100.0(23.1)	96.2(17.3)
EQUARV	.0(.0)	.0(.0)	.0(.0)	100.0(.5)	17.4(.5)	29.4(1.0)	34.6(.6)
ERIGER	5.1(1.8)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	.0(.0)	9.6(1.0)
ERIPER	10.3(3.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.9(.5)	3.8(1.8)
ERYGRA	28.2(3.6)	10.0(.5)	16.7(3.0)	.0(.0)	4.3(.5)	.0(.0)	3.8(.5)
FRAVIR	43.6(1.4)	50.0(1.5)	83.3(2.9)	.0(.0)	13.0(1.3)	64.7(1.8)	26.9(2.8)
GALTRI	12.8(1.5)	10.0(.5)	16.7(.5)	100.0(3.0)	34.8(.5)	5.9(.5)	51.9(1.1)
GOOSEL	7.7(.5)	10.0(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
GYMDRY	2.6(.5)	.0(.0)	16.7(.5)	100.0(20.0)	34.8(1.1)	.0(.0)	48.1(6.5)
HERSPH	.0(.0)	10.0(.5)	.0(.0)	100.0(.5)	47.8(5.0)	41.2(.9)	38.5(.9)
HEUCYL	28.2(1.0)	40.0(2.4)	50.0(.5)	.0(.0)	.0(.0)	.0(.0)	1.9(.5)
LIGUST	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.9(.5)	13.5(.5)
LOMDIS	2.6(.5)	.0(.0)	33.3(1.8)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
LUPINU	5.1(.5)	10.0(3.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
MIMLEW	.0(.0)	.0(.0)	.0(.0)	.0(.0)	8.7(1.8)	.0(.0)	.0(.0)
MITSPE	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	21.7(1.5)	5.9(.5)	15.4(1.1)
PARFIM	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	.0(.0)	.0(.0)
PEDPRA	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	.0(.0)	.0(.0)
PEDCON	7.7(.5)	.0(.0)	16.7(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
POLLON	7.7(.5)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	5.9(.5)	5.8(.5)
PTEAQU	10.3(1.8)	10.0(10.0)	.0(.0)	.0(.0)	17.4(1.1)	41.2(2.2)	38.5(6.4)
PYRASA	2.6(.5)	.0(.0)	16.7(3.0)	.0(.0)	.0(.0)	.0(.0)	1.9(.5)
RANUNC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	.0(.0)	.0(.0)
SAXIFR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.9(3.0)
SAXODO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
SEDUMX	7.7(.5)	10.0(.5)	50.0(1.3)	.0(.0)	.0(.0)	.0(.0)	.0(.0)

SENTRI	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	69.6(6.0)	23.5(1.1)	36.5(1.9)
SMIRAC	3e.5(.7)	.0(.0)	100.0(.5)	.0(.0)	17.4(2.9)	11.8(1.8)	2e.9(1.4)
SMISTE	41.0(2.5)	50.0(3.4)	50.0(1.3)	100.0(20.0)	e0.9(5.4)	76.5(5.3)	71.2(4.9)
STRAMP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	13.0(.5)	11.8(.5)	11.5(.9)
TARDFF	.0(.0)	.0(.0)	.0(.0)	.0(.0)	13.0(.5)	11.8(.5)	7.7(.5)
THAOCC	56.4(2.7)	10.0(.5)	83.3(1.5)	100.0(3.0)	78.3(e.1)	58.8(2.e)	78.8(1.8)
TIATRI	2.6(.5)	.0(.0)	.0(.0)	100.0(10.0)	17.4(.5)	11.8(.5)	38.5(1.6)
TRIOVA	2.6(.5)	.0(.0)	.0(.0)	100.0(.5)	8.7(.5)	5.9(.5)	17.3(.5)
URTDIO	2.5(.5)	.0(.0)	.0(.0)	.0(.0)	34.8(.8)	23.5(.5)	15.4(.8)
VALSIT	2.6(.5)	.0(.0)	.0(.0)	.0(.0)	4.3(.5)	.0(.0)	1.9(.5)
VERVIR	12.8(7.4)	20.0(.5)	.0(.0)	100.0(3.0)	56.5(.9)	29.4(.5)	42.3(.6)
VIOGLA	5.1(1.8)	.0(.0)	.0(.0)	100.0(10.6)	5e.5(4.7)	23.5(3.5)	59.6(5.2)
VIOORE	7.7(.5)	.0(.0)	.0(.0)	100.0(.5)	.0(.0)	.0(.0)	5.8(.5)
XERTEN	92.3(20.8)	e0.0(9.9)	33.3(.5)	.0(.0)	43.5(2.9)	e4.7(10.1)	e3.8(13.4)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	LAROCC/PACMYR N = 26	PSEMEN/PACMYR N = 22
***** TREES *****		
ABILAS	100.0(4.1)	90.9(7.4)
BETPAP	11.5(.5)	13.6(2.2)
LAROCC	100.0(27.4)	72.7(9.6)
PICENG	92.3(3.1)	100.0(9.3)
PINALB	3.8(.5)	13.6(.5)
PINCON	73.1(4.1)	54.4(7.6)
PINMON	57.7(.7)	9.1(5.3)
POPTRE	15.4(.5)	.0(.0)
POPTRI	65.4(1.6)	.0(.0)
PSEMEN	65.4(2.1)	100.0(26.3)
***** SHRUBS *****		
ACEGLA	88.5(7.9)	90.9(9.4)
ALNVIR	80.8(4.3)	68.2(2.8)
AMEALN	69.8(4.6)	59.1(3.8)
BERREP	3.8(.5)	9.1(1.5)
CEAVEL	15.4(1.1)	9.1(1.8)
CORSTO	23.1(.9)	9.1(.5)
HOLDIS	15.4(.5)	9.1(.5)
JUNCOM	.0(.0)	9.1(1.8)
LINBOR	42.3(1.4)	.0(.0)
LONINV	11.5(2.2)	.0(.0)
LONUTA	92.3(2.4)	68.2(1.0)
MENFER	53.8(3.2)	68.2(2.1)
OPLHOR	.0(.0)	.0(.0)
PACMYR	100.0(15.8)	100.0(14.5)
PRUVIR	.0(.0)	4.5(.5)
RHAALN	7.7(6.5)	4.5(.5)
RIBESX	15.4(.5)	4.5(3.0)
RIBLAC	46.2(.9)	31.8(.5)
RIBVIS	7.7(3.0)	18.2(.5)
ROSAXX	26.9(.5)	18.2(.5)
RUBIDA	7.7(.5)	4.5(.5)
RUBPAR	80.8(4.5)	90.9(7.3)
SALIXX	26.9(.9)	68.2(3.4)
SALSCO	15.4(.5)	.0(.0)
SAMRAC	30.8(1.7)	4.5(.5)
SORSCO	73.1(2.3)	90.9(9.1)
SPIBET	61.5(4.3)	45.5(2.9)
SPIDEN	42.3(4.1)	18.2(4.1)
SYMALB	42.3(6.5)	18.2(1.1)
TAXBRE	50.0(2.5)	45.5(1.4)
VACGLO	100.0(11.3)	95.5(16.7)
VACSCO	11.5(7.8)	18.2(1.8)
***** GRASSES *****		
CALAMA	15.4(4.1)	.0(.0)
CALRUB	7.7(20.0)	.0(.0)

CAREXX	11.5(2.2)	22.7(3.9)
CARGEY	65.4(12.1)	18.2(4.1)
GRASSP	57.7(8.9)	68.2(2.3)
LUZGLA	7.7(.5)	4.5(.5)
PSESPI	.0(.0)	.0(.0)
***** FORBS *****		
ACHMIL	23.1(.5)	4.5(.5)
ACTRUB	3.8(.5)	9.1(.5)
ADEBIC	3.8(.5)	22.7(2.9)
ANAMAR	42.3(1.2)	4.5(.5)
ANEOCC	.0(.0)	.0(.0)
ANGARG	.0(.0)	.0(.0)
ANTRAC	19.2(.5)	13.6(.5)
APOAND	3.8(.5)	.0(.0)
APOCYN	.0(.0)	.0(.0)
AQUFLA	.0(.0)	.0(.0)
ARANUD	34.6(.5)	.0(.0)
ARNLAT	73.1(3.6)	77.3(15.4)
ASTCON	3.8(.5)	31.8(2.9)
ASTENG	3.8(.5)	.0(.0)
ASTERX	3.8(.5)	18.2(1.8)
ATHFIL	11.5(1.3)	13.6(.5)
CALAPI	.0(.0)	.0(.0)
CAMPOT	.0(.0)	.0(.0)
CASTIL	3.8(.5)	4.5(.5)
CHIUMB	3.8(.5)	13.6(.5)
CIRSIU	30.8(.5)	4.5(.5)
CLAPLA	.0(.0)	.0(.0)
CLIUNI	84.6(2.3)	86.4(6.1)
DISHOO	11.5(.5)	18.2(1.1)
EPIANG	100.0(13.0)	68.2(3.3)
EQUARV	19.2(1.0)	.0(.0)
ERIGER	3.8(.5)	18.2(1.8)
ERIPER	.0(.0)	.0(.0)
ERYGRA	11.5(3.7)	4.5(.5)
FRAVIR	50.0(1.3)	36.4(.5)
GALTRI	23.1(.9)	22.7(1.5)
GOODEL	.0(.0)	36.4(.5)
GYMDRY	7.7(.5)	18.2(1.1)
HERSPH	.0(.0)	9.1(.5)
HEUCYL	3.8(.5)	.0(.0)
LIGUST	.0(.0)	.0(.0)
LOMDIS	3.8(.5)	.0(.0)
LUPINU	.0(.0)	.0(.0)
MIMLEW	.0(.0)	.0(.0)
MITBRE	3.8(.5)	9.1(6.5)
PARFIX	.0(.0)	.0(.0)
PEDBRA	.0(.0)	4.5(.5)
PEDCON	.0(.0)	4.5(.5)
POLLON	.0(.0)	4.5(.5)
PTEAQU	38.5(1.3)	27.3(.9)
PYRASA	7.7(.5)	22.7(.5)
RANJNC	7.7(.5)	.0(.0)
SAXIFR	.0(.0)	.0(.0)
SAXODO	.0(.0)	.0(.0)
SEDUMX	.0(.0)	.0(.0)

SENTRI	.0(.0)	13.6(.5)
SMIRAC	3.8(.5)	18.2(.5)
SMISTE	80.8(2.6)	50.0(5.2)
STRAMP	7.7(.5)	.0(.0)
TAROFF	3.8(.5)	.0(.0)
THAOCC	53.8(.9)	86.2(2.6)
TIATRI	19.2(1.0)	18.2(5.3)
TRICVA	15.4(.5)	9.1(.5)
URTDIO	.0(.0)	.0(.0)
VALSIT	.0(.0)	.0(.0)
VERVIR	23.1(.5)	27.3(.5)
VIOGLA	26.9(1.2)	27.3(.5)
VIOORE	7.7(.5)	31.8(1.2)
XERTEN	84.6(17.0)	90.9(19.7)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	ABILAS/VACGLO N = 20	ABILAS/VACGLO N = 15	ABLA/CLUN/XETE N = 34	ABILAS/MENFER N = 59	ABILAS/MENFER N = 17	ABLA/CLUN/MEFE N = 64	ABLA/XETE/VAGL N = 27
***** TREES *****							
ABILAS	100.0(9.1)	100.0(9.6)	100.0(23.9)	98.3(15.0)	100.0(17.9)	100.0(26.2)	100.0(18.6)
LAROCC	65.0(4.8)	26.7(.5)	41.2(6.5)	16.9(.8)	17.6(3.7)	26.6(2.8)	11.1(.5)
PICENG	95.0(4.8)	80.0(9.7)	94.1(13.8)	96.6(5.8)	100.0(6.5)	95.3(11.4)	59.3(11.0)
PINALB	.0(.0)	53.3(.8)	14.7(1.0)	15.3(1.8)	35.3(2.9)	31.2(1.8)	74.1(5.0)
PINCON	30.0(2.1)	33.3(2.9)	29.4(7.7)	20.3(.7)	23.5(10.2)	10.9(3.6)	22.2(33.3)
PINMON	30.0(1.3)	20.0(1.3)	32.4(.5)	8.5(.5)	.0(.0)	4.7(.5)	7.4(.5)
POPTRE	30.0(1.3)	.0(.0)	8.8(.5)	1.7(.5)	.0(.0)	.0(.0)	.0(.0)
POPTRI	65.0(1.5)	6.7(.5)	.0(.0)	28.8(1.5)	5.9(.5)	1.6(.5)	.0(.0)
PSEMEN	60.0(4.2)	73.3(8.9)	73.5(12.0)	15.3(1.1)	29.4(8.7)	31.2(8.4)	55.6(7.3)
***** SHRUBS *****							
ACEGLA	95.0(10.1)	53.3(9.3)	88.2(9.8)	37.3(3.2)	17.6(7.8)	31.2(6.7)	18.5(1.5)
ALNVIR	90.0(7.1)	26.7(6.0)	50.0(4.2)	79.7(8.5)	52.9(2.4)	62.5(5.0)	25.9(.9)
AMEALN	35.0(4.6)	60.0(7.2)	52.9(3.9)	3.4(.5)	.0(.0)	17.2(1.0)	44.4(3.3)
BERREP	.0(.0)	13.3(1.8)	17.6(.5)	.0(.0)	.0(.0)	1.6(.5)	.0(.0)
CEAVEL	15.0(1.3)	6.7(.5)	11.8(.5)	.0(.0)	.0(.0)	.0(.0)	3.7(.5)
JUNCOM	.0(.0)	6.7(.5)	2.9(.5)	.0(.0)	.0(.0)	3.1(.5)	3.7(.5)
LONINV	10.0(.5)	.0(.0)	.0(.0)	16.9(1.3)	5.9(.5)	15.6(1.0)	.0(.0)
LONUTA	90.0(3.1)	53.3(.8)	64.7(2.2)	74.6(1.2)	35.3(1.3)	45.3(1.2)	33.3(.8)
MENFER	70.0(2.6)	60.0(2.4)	44.1(2.4)	100.0(33.4)	100.0(40.6)	100.0(37.2)	33.3(3.2)
OPLHOR	5.0(.5)	.0(.0)	2.9(.5)	5.1(3.7)	5.9(10.0)	7.8(6.9)	.0(.0)
PACMYR	90.0(12.9)	100.0(9.1)	88.2(6.3)	49.2(3.2)	41.2(5.7)	43.7(3.1)	81.5(7.8)
RIBLAC	60.0(2.1)	20.0(.5)	38.2(2.4)	79.7(1.9)	47.1(.8)	57.8(1.9)	11.1(.5)
RIBVIS	25.0(.5)	6.7(.5)	11.8(.5)	3.4(.5)	.0(.0)	.0(.0)	3.7(.5)
ROSAXX	10.0(.5)	.0(.0)	11.8(.5)	1.7(.5)	.0(.0)	.0(.0)	3.7(.5)
RUBPAR	95.0(8.5)	26.7(3.5)	79.4(6.6)	84.7(8.9)	52.9(2.4)	62.5(5.5)	25.9(3.9)
SALIXX	60.0(1.1)	40.0(1.3)	8.8(.5)	18.6(.7)	17.6(2.2)	4.7(.5)	18.5(2.4)
SALSCO	15.0(6.8)	.0(.0)	2.9(10.0)	10.2(2.1)	5.9(.5)	.0(.0)	.0(.0)
SAMRAC	35.0(2.6)	.0(.0)	17.6(4.2)	86.4(2.8)	17.6(.5)	37.5(1.8)	7.4(.5)
SHEPHE	.0(.0)	.0(.0)	5.9(5.3)	.0(.0)	.0(.0)	6.3(1.1)	7.4(.5)
SORSCO	65.0(2.9)	80.0(4.3)	88.2(5.0)	66.1(4.0)	88.2(1.8)	85.9(5.3)	81.5(9.3)
SORSIT	.0(.0)	.0(.0)	5.9(1.8)	1.7(.5)	.0(.0)	1.6(10.0)	3.7(3.0)
SPIBET	30.0(6.6)	66.7(1.8)	38.2(1.7)	11.9(1.2)	23.5(1.8)	18.7(1.1)	18.5(1.0)
SPIDEN	30.0(5.8)	6.7(.5)	11.8(21.5)	39.0(1.7)	5.9(10.0)	14.1(7.8)	40.7(6.3)
SYMALB	35.0(5.0)	26.7(1.1)	11.8(1.1)	6.8(1.1)	.0(.0)	.0(.0)	3.7(.5)
TAXBRE	70.0(3.6)	20.0(1.3)	35.3(12.0)	13.6(6.9)	11.8(15.2)	15.6(7.6)	3.7(.5)
VACGLO	90.0(18.5)	93.3(25.7)	94.1(19.1)	100.0(17.9)	94.1(27.7)	96.9(21.5)	96.3(30.8)
VACSCO	5.0(.5)	66.7(8.5)	29.4(5.8)	8.5(.5)	29.4(7.2)	25.0(3.4)	74.1(9.9)
***** GRASSES *****							
CALAMA	.0(.0)	.0(.0)	.0(.0)	10.2(4.6)	.0(.0)	1.6(.5)	.0(.0)
CAREXX	55.0(6.4)	20.0(3.7)	50.0(2.1)	54.2(6.0)	23.5(1.8)	21.9(2.1)	25.9(5.7)
CARGEY	25.0(1.5)	60.0(5.6)	8.8(7.7)	39.0(2.2)	29.4(2.9)	15.6(1.0)	37.0(3.9)
GRASSP	85.0(7.1)	33.3(1.0)	61.8(4.6)	76.3(6.7)	35.3(2.6)	56.2(3.0)	14.8(7.8)
JUNPAR	.0(.0)	13.3(6.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
LUZGLA	.0(.0)	6.7(.5)	8.8(.5)	32.2(6.5)	41.2(1.6)	18.7(5.0)	3.7(10.0)
LUZPAR	.0(.0)	.0(.0)	.0(.0)	6.8(3.5)	5.9(.5)	7.8(2.9)	.0(.0)

***** FORBS *****							
ACHMIL	15.0(1.3)	40.0(.5)	11.8(.5)	5.1(.5)	.0(.0)	1.6(.5)	7.4(.5)
ACTRUB	15.0(.5)	6.7(.5)	32.4(1.8)	18.6(1.0)	.0(.0)	20.3(.5)	.0(.0)
ANAMAR	40.0(6.4)	6.7(3.0)	2.9(.5)	72.9(2.3)	11.8(.5)	3.1(.5)	.0(.0)
ANEOCC	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
ANTRAC	.0(.0)	6.7(.5)	8.8(.5)	.0(.0)	.0(.0)	9.4(1.3)	7.4(1.8)
AQUFLA	.0(.0)	.0(.0)	.0(.0)	1.7(.5)	.0(.0)	.0(.0)	.0(.0)
ARECAP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	3.7(3.0)
ARNLAT	90.0(5.4)	40.0(5.0)	61.8(4.8)	81.4(5.0)	94.1(5.9)	70.3(7.7)	25.9(3.9)
ASTCON	5.0(.5)	20.0(.5)	8.8(2.2)	.0(.0)	5.9(.5)	7.8(1.5)	7.4(.5)
ASTENG	5.0(.5)	.0(.0)	11.8(.5)	1.7(3.0)	11.8(1.8)	4.7(3.7)	.0(.0)
ASTERX	15.0(1.3)	20.0(.5)	20.6(1.2)	1.7(.5)	5.9(.5)	7.8(3.4)	18.5(3.4)
ATHFIL	50.0(2.9)	.0(.0)	35.3(3.5)	52.5(2.5)	23.5(5.9)	43.7(3.1)	.0(.0)
CALAPI	.0(.0)	6.7(.5)	2.9(.5)	.0(.0)	.0(.0)	1.6(.5)	7.4(.5)
CAMROT	.0(.0)	.0(.0)	2.9(.5)	.0(.0)	.0(.0)	1.6(.5)	3.7(.5)
CASTIL	.0(.0)	.0(.0)	5.9(.5)	1.7(.5)	11.8(.5)	6.3(.5)	3.7(.5)
CHIUMB	.0(.0)	6.7(.5)	11.8(1.1)	.0(.0)	.0(.0)	4.7(.5)	7.4(.5)
CIRSIU	35.0(.5)	6.7(.5)	.0(.0)	11.9(.5)	.0(.0)	3.1(.5)	.0(.0)
CLAFLA	.0(.0)	.0(.0)	.0(.0)	10.2(.9)	5.9(.5)	.0(.0)	3.7(3.0)
CLIUNI	95.0(6.1)	33.3(1.0)	88.2(5.6)	71.2(2.7)	47.1(2.3)	57.8(3.8)	11.1(4.5)
DISHOO	5.0(.5)	6.7(.5)	20.6(1.9)	3.4(.5)	5.9(3.0)	9.4(1.3)	.0(.0)
EPIANG	85.0(17.3)	40.0(1.8)	50.0(2.8)	93.2(13.6)	52.9(1.8)	42.2(1.7)	55.6(7.2)
EQUARV	15.0(.5)	.0(.0)	.0(.0)	5.1(.5)	.0(.0)	4.7(.5)	.0(.0)
ERIFLA	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
ERIGER	5.0(.5)	26.7(.5)	2.9(3.0)	3.4(5.3)	5.9(.5)	12.5(1.1)	11.1(.5)
ERIPER	5.0(.5)	.0(.0)	8.8(1.3)	.0(.0)	.0(.0)	3.1(.5)	7.4(1.8)
ERYGRA	.0(.0)	13.3(1.8)	5.9(.5)	11.9(1.2)	17.6(5.3)	6.3(.5)	7.4(6.5)
FRAVIR	15.0(2.2)	13.3(.5)	8.8(.5)	.0(.0)	.0(.0)	3.1(.5)	7.4(.5)
GALTRI	35.0(.9)	.0(.0)	20.6(.5)	28.8(1.2)	11.8(.5)	39.1(.9)	.0(.0)
GOOOBL	.0(.0)	6.7(.5)	20.6(.5)	.0(.0)	5.9(.5)	17.2(.7)	11.1(.5)
GYMDRY	55.0(2.9)	.0(.0)	14.7(.5)	39.0(5.0)	11.8(1.8)	42.2(9.1)	.0(.0)
HEDALP	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
HERSPH	15.0(1.3)	6.7(.5)	8.8(4.5)	42.4(.8)	11.8(3.0)	25.0(.8)	3.7(.5)
HEUCYL	.0(.0)	20.0(1.3)	5.9(1.8)	.0(.0)	.0(.0)	1.6(.5)	3.7(.5)
HYPSCO	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
LIGUST	.0(.0)	.0(.0)	5.9(35.2)	5.1(.5)	5.9(3.0)	7.8(1.0)	.0(.0)
LOMDIS	.0(.0)	6.7(20.0)	5.9(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
MIMLEW	.0(.0)	.0(.0)	.0(.0)	6.8(.5)	5.9(.5)	3.1(.5)	.0(.0)
MITBRE	15.0(2.2)	.0(.0)	17.6(1.8)	50.8(2.3)	11.8(1.8)	39.1(4.8)	.0(.0)
ORTSEC	.0(.0)	6.7(.5)	2.9(.5)	.0(.0)	5.9(.5)	7.8(.5)	7.4(.5)
PARFIM	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	3.1(.5)	.0(.0)
PEDBRA	.0(.0)	6.7(.5)	.0(.0)	.0(.0)	23.5(1.1)	9.4(.9)	7.4(.5)
PEDCON	.0(.0)	13.3(5.3)	5.9(.5)	1.7(.5)	5.9(3.0)	9.4(.9)	.0(.0)
PEDRAC	.0(.0)	6.7(.5)	5.9(1.8)	1.7(.5)	11.8(1.8)	4.7(.5)	3.7(.5)
PENLYA	.0(.0)	6.7(3.0)	2.9(.5)	.0(.0)	.0(.0)	.0(.0)	3.7(.5)
PENSTE	5.0(.5)	.0(.0)	.0(.0)	3.4(.5)	.0(.0)	.0(.0)	.0(.0)
POLLON	10.0(.5)	.0(.0)	14.7(.5)	10.2(.5)	17.6(.5)	15.6(.8)	.0(.0)
PTEAQU	15.0(1.3)	13.3(5.3)	14.7(.5)	5.1(.5)	.0(.0)	7.8(1.0)	3.7(20.0)
RANUNC	5.0(.5)	.0(.0)	.0(.0)	1.7(.5)	.0(.0)	.0(.0)	.0(.0)
SENTRI	30.0(2.5)	13.3(1.8)	29.4(1.9)	76.3(4.4)	47.1(6.0)	62.5(2.4)	3.7(.5)
SMIRAC	10.0(.5)	6.7(.5)	14.7(1.0)	13.6(.8)	5.9(.5)	10.9(.5)	14.8(1.1)
SMISTE	85.0(6.3)	13.3(1.8)	50.0(2.8)	37.3(2.8)	17.6(8.7)	28.1(1.6)	7.4(.5)
SOLCAN	25.0(.5)	.0(.0)	.0(.0)	6.8(.5)	.0(.0)	1.6(.5)	.0(.0)
STRAMP	5.0(3.0)	.0(.0)	.0(.0)	3.4(.5)	5.9(.5)	14.1(.5)	.0(.0)
THAOCC	65.0(2.0)	40.0(1.3)	67.6(4.0)	76.3(3.3)	35.3(1.8)	70.3(4.3)	33.3(3.2)
TIATRI	65.0(1.5)	.0(.0)	26.5(1.1)	37.3(3.0)	23.5(1.1)	57.8(5.6)	.0(.0)
URTDIO	10.0(.5)	.0(.0)	8.8(1.3)	11.9(.9)	.0(.0)	6.3(1.1)	3.7(3.0)

VALSIT	.0(.0)	.0(.0)	.0(.0)	1.7(.5)	23.5(.5)	4.7(1.3)	.0(.0)
VERVIR	50.0(.5)	.0(.0)	17.6(.5)	57.6(.5)	47.1(1.1)	37.5(.9)	7.4(.5)
VIOGLA	40.0(2.3)	6.7(10.0)	52.9(2.0)	45.8(4.8)	35.3(6.2)	43.7(4.6)	3.7(.5)
VIOORB	25.0(.5)	6.7(.5)	23.5(.8)	8.5(.5)	29.4(.5)	18.7(.7)	7.4(.5)
XERTEN	60.0(9.4)	100.0(30.7)	94.1(21.4)	57.6(3.4)	88.2(15.2)	73.4(14.9)	92.6(32.8)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	ABILAS/VACGLO N = 34	VACGLO/XERTEN N = 28	ABILAS/VACGLO N = 79	ABLA/LUHI/XETE N = 48	ABILAS/MENFER N = 56	ABLA/LUHI/MEFE N = 111	ABILAS/LUZHIT N = 10
***** TREES *****							
ABILAS	100.0(15.7)	96.4(6.7)	100.0(28.6)	97.9(34.7)	98.2(21.0)	100.0(34.9)	100.0(36.0)
LAROCC	14.7(.5)	7.1(.5)	5.1(.5)	2.1(.5)	1.8(.5)	2.7(.5)	.0(.0)
PICENG	64.7(3.7)	21.4(2.9)	40.5(3.5)	39.6(2.2)	73.2(3.9)	64.0(8.0)	10.0(.5)
PINALB	73.5(1.3)	92.9(3.2)	94.9(3.8)	95.8(4.4)	76.8(2.9)	72.1(4.2)	60.0(.9)
PINCON	23.5(8.7)	3.6(3.0)	3.8(4.5)	6.3(3.7)	1.8(.5)	5.4(3.3)	.0(.0)
PINMON	2.9(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.8(1.8)	.0(.0)
POPTRE	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
POPTRI	.0(.0)	.0(.0)	1.3(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
PSEMEN	50.0(7.5)	7.1(5.3)	8.9(2.6)	4.2(.5)	.0(.0)	7.2(1.8)	.0(.0)
***** SHRUBS *****							
ACEGLA	26.5(4.6)	14.3(5.4)	7.6(2.5)	.0(.0)	.0(.0)	2.7(2.2)	.0(.0)
ALNVIR	26.5(3.2)	14.3(13.4)	5.1(2.9)	4.2(15.2)	23.2(10.9)	24.3(3.0)	.0(.0)
AMEALN	64.7(3.0)	25.0(3.3)	11.4(4.8)	8.3(2.4)	.0(.0)	1.8(.5)	.0(.0)
BERREP	17.6(.5)	.0(.0)	3.8(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
CEAVEL	5.9(15.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.9(.5)	.0(.0)
JUNCOM	8.8(1.3)	14.3(1.1)	8.9(1.2)	4.2(.5)	1.8(.5)	.9(3.0)	.0(.0)
LONINV	.0(.0)	.0(.0)	.0(.0)	.0(.0)	10.7(1.3)	3.6(.5)	.0(.0)
LONUTA	38.2(1.1)	25.0(.9)	13.9(.5)	6.3(.5)	21.4(.5)	18.0(1.0)	10.0(.5)
MENFER	26.5(2.4)	28.6(2.6)	62.0(4.9)	54.2(1.3)	100.0(38.5)	98.2(38.1)	30.0(.5)
OPLHOR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
PACMYR	94.1(8.4)	46.4(7.8)	26.6(8.3)	14.6(1.6)	12.5(5.4)	21.6(4.4)	.0(.0)
RIBLAC	17.6(.5)	21.4(.5)	20.3(.7)	4.2(.5)	30.4(1.4)	19.8(.7)	.0(.0)
RIBVIS	23.5(.5)	.0(.0)	1.3(.5)	2.1(.5)	.0(.0)	.0(.0)	.0(.0)
ROSAXX	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.8(.5)	.9(.5)	.0(.0)
RUBPAR	50.0(3.3)	3.6(20.0)	6.3(5.4)	2.1(3.0)	10.7(2.5)	13.5(2.3)	.0(.0)
SALIXX	17.6(.5)	7.1(.5)	2.5(1.8)	2.1(.5)	5.4(10.2)	.0(.0)	.0(.0)
SALSCO	5.9(5.3)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.9(10.0)	.0(.0)
SAMRAC	5.9(.5)	10.7(3.7)	6.3(.5)	8.3(.5)	28.6(1.4)	15.3(.9)	10.0(.5)
SHEPHE	17.6(1.3)	14.3(1.1)	3.8(2.2)	4.2(6.5)	.0(.0)	1.8(.5)	.0(.0)
SORSCO	94.1(6.9)	71.4(3.3)	54.4(2.0)	50.0(3.9)	66.1(2.0)	67.6(3.2)	20.0(.5)
SORSIT	2.9(.5)	10.7(.5)	5.1(1.1)	16.7(.5)	.0(.0)	5.4(.5)	10.0(.5)
SPIBET	32.4(3.4)	21.4(1.8)	16.5(2.6)	14.6(1.9)	1.8(3.0)	11.7(1.3)	.0(.0)
SPIDEN	35.3(5.5)	39.3(3.1)	25.3(3.3)	37.5(2.5)	25.0(7.0)	19.8(3.7)	20.0(.5)
SYMALB	8.8(.5)	.0(.0)	1.3(3.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
TAXBRE	.0(.0)	.0(.0)	1.3(.5)	.0(.0)	1.8(.5)	.9(3.0)	.0(.0)
VACGLO	97.1(23.7)	100.0(18.5)	94.9(18.5)	100.0(25.3)	100.0(17.4)	98.2(25.4)	50.0(3.4)
VACSCO	64.7(8.9)	96.4(16.2)	92.4(17.6)	93.7(18.1)	67.9(7.8)	70.3(9.3)	70.0(1.6)
***** GRASSES *****							
CALAMA	2.9(.5)	3.6(20.0)	1.3(.5)	.0(.0)	.0(.0)	.9(3.0)	.0(.0)
CAREXX	38.2(6.2)	42.9(14.5)	41.8(6.2)	50.0(5.0)	41.1(5.0)	33.3(2.5)	50.0(5.3)
CARGEY	58.8(5.4)	46.4(10.2)	32.9(4.8)	18.7(3.7)	19.6(2.3)	9.0(2.2)	10.0(.5)
GRASSP	35.3(3.3)	53.6(3.9)	38.0(3.6)	54.2(2.4)	46.4(3.2)	43.2(1.8)	60.0(5.0)
JUNPAR	2.9(.5)	21.4(6.1)	7.6(4.5)	2.1(3.0)	.0(.0)	.9(3.0)	.0(.0)
LUZGLA	8.8(2.2)	60.7(7.2)	83.5(14.6)	95.8(16.9)	85.7(11.7)	90.1(14.2)	100.0(38.3)
LUZPAR	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)

***** FORBS *****							
ACHMIL	35.3(1.5)	32.1(1.8)	12.7(.5)	12.5(1.3)	.0(.0)	3.6(.5)	.0(.0)
ACTRUB	2.9(.5)	3.6(.5)	1.3(.5)	2.1(.5)	1.8(.5)	.9(.5)	.0(.0)
ANAMAR	11.8(.5)	3.6(.5)	2.5(1.8)	.0(.0)	1.8(10.0)	.9(.5)	.0(.0)
ANEOCC	.0(.0)	.0(.0)	22.8(2.2)	6.3(1.3)	12.5(1.2)	4.5(1.5)	40.0(5.9)
ANTRAC	20.6(1.2)	14.3(.5)	5.1(.5)	.0(.0)	1.8(.5)	1.8(.5)	.0(.0)
AQUFLA	.0(.0)	7.1(.5)	6.3(.5)	2.1(.5)	5.4(.5)	.0(.0)	.0(.0)
ARECAP	8.8(2.2)	25.0(.5)	8.9(2.6)	14.6(2.6)	1.8(3.0)	.0(.0)	.0(.0)
ARNLAT	26.5(2.1)	53.6(3.2)	69.6(6.6)	66.7(7.2)	71.4(5.2)	83.8(7.3)	90.0(8.8)
ASTCON	17.6(1.3)	7.1(.5)	1.3(.5)	.0(.0)	1.8(3.0)	2.7(15.3)	.0(.0)
ASTENG	17.6(3.3)	3.6(.5)	2.5(5.3)	.0(.0)	1.8(.5)	.9(3.0)	.0(.0)
ASTERX	8.8(3.7)	25.0(5.7)	16.5(3.5)	25.0(1.3)	1.8(.5)	15.3(1.9)	40.0(1.8)
ATHFIL	2.9(.5)	3.6(20.0)	1.3(.5)	.0(.0)	10.7(2.1)	6.3(5.1)	.0(.0)
CALAPI	26.5(.5)	7.1(.5)	2.5(.5)	4.2(1.8)	1.8(.5)	.0(.0)	.0(.0)
CAMROT	5.9(.5)	10.7(.5)	7.6(.5)	10.4(.5)	3.6(.5)	3.6(.5)	.0(.0)
CASTIL	17.6(1.3)	10.7(.5)	22.8(.6)	20.8(.8)	21.4(.5)	12.6(.9)	30.0(1.3)
CHIUMB	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.9(.5)	.0(.0)
CIRSIU	.0(.0)	3.6(.5)	.0(.0)	.0(.0)	1.8(.5)	.0(.0)	.0(.0)
CLAFLA	.0(.0)	7.1(.5)	2.5(3.0)	8.3(2.9)	1.8(.5)	.9(.5)	10.0(.5)
CLIUNI	14.7(1.0)	.0(.0)	1.3(3.0)	4.2(.5)	7.1(1.1)	4.5(3.4)	.0(.0)
DISHOO	.0(.0)	3.6(10.0)	.0(.0)	.0(.0)	1.8(3.0)	1.8(.5)	.0(.0)
EPIANG	79.4(5.3)	67.9(3.7)	50.6(3.2)	35.4(1.9)	64.3(4.4)	41.4(3.0)	20.0(1.8)
EQUARV	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.4(1.3)	.0(.0)	.0(.0)
ERIFLA	11.8(1.8)	28.6(2.3)	5.1(.5)	6.3(1.3)	1.8(.5)	.9(.5)	.0(.0)
ERIGER	20.6(.5)	35.7(.5)	32.9(1.1)	22.9(1.0)	16.1(1.9)	14.4(.7)	10.0(10.0)
ERIPER	11.8(2.4)	14.3(4.1)	25.3(1.4)	31.2(1.2)	8.9(3.4)	13.5(.8)	30.0(6.8)
ERYGRA	32.4(2.0)	53.6(5.3)	64.6(4.7)	66.7(6.3)	33.9(3.3)	37.8(2.8)	90.0(13.2)
FRAVIR	35.3(1.3)	7.1(.5)	6.3(.5)	2.1(3.0)	7.1(.5)	.9(.5)	.0(.0)
GALTRI	.0(.0)	3.6(3.0)	1.3(.5)	2.1(.5)	8.9(2.0)	7.2(1.1)	.0(.0)
GOOOBL	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.9(.5)	.0(.0)
GYMDRY	.0(.0)	.0(.0)	.0(.0)	.0(.0)	7.1(1.1)	3.6(10.9)	.0(.0)
HEDALP	.0(.0)	17.9(6.7)	6.3(3.9)	.0(.0)	1.8(10.0)	3.6(3.0)	.0(.0)
HERSPH	5.9(.5)	3.6(10.0)	1.3(.5)	4.2(.5)	16.1(1.8)	9.0(.8)	.0(.0)
HEUCYL	20.6(1.2)	25.0(1.2)	6.3(1.5)	2.1(.5)	7.1(.5)	5.4(.9)	.0(.0)
HYPSCO	.0(.0)	7.1(.5)	5.1(3.0)	6.3(2.2)	.0(.0)	1.8(.5)	10.0(10.0)
LIGUST	.0(.0)	.0(.0)	.0(.0)	.0(.0)	1.8(.5)	.9(.5)	.0(.0)
LOMDIS	.0(.0)	10.7(1.3)	2.5(.5)	2.1(.5)	.0(.0)	.9(.5)	.0(.0)
MIMLEW	5.9(.5)	.0(.0)	1.3(.5)	4.2(.5)	1.8(.5)	5.4(.5)	10.0(.5)
MITBRE	2.9(.5)	3.6(3.0)	17.7(2.1)	16.7(.8)	37.5(5.1)	38.7(3.9)	40.0(3.5)
ORTSEC	.0(.0)	.0(.0)	.0(.0)	4.2(.5)	.0(.0)	3.6(.5)	.0(.0)
PARFIM	.0(.0)	.0(.0)	.0(.0)	.0(.0)	12.5(1.9)	4.5(.5)	.0(.0)
PEDBRA	2.9(.5)	10.7(.5)	24.1(1.2)	16.7(.5)	30.4(.9)	18.0(.9)	30.0(1.3)
PEDCON	11.8(.5)	3.6(.5)	8.9(1.9)	2.1(.5)	7.1(1.1)	10.8(.9)	.0(.0)
PEDRAC	2.9(10.0)	10.7(.5)	24.1(1.2)	14.6(.5)	10.7(.9)	18.9(.7)	10.0(.5)
PENLYA	2.9(.5)	17.9(1.0)	7.6(2.1)	4.2(.5)	3.6(.5)	1.8(.5)	.0(.0)
PENSTE	2.9(.5)	10.7(1.3)	7.6(.5)	10.4(1.0)	.0(.0)	1.8(1.8)	.0(.0)
POLLON	5.9(.5)	3.6(.5)	5.1(.5)	.0(.0)	16.1(.5)	9.9(.5)	.0(.0)
PTEAQU	2.9(.5)	.0(.0)	.0(.0)	.0(.0)	1.8(.5)	.0(.0)	10.0(.5)
RANUNC	2.9(.5)	.0(.0)	3.8(2.2)	2.1(.5)	7.1(1.1)	2.7(1.3)	30.0(4.5)
SENTRI	26.5(1.1)	14.3(1.1)	36.7(4.2)	22.9(2.7)	66.1(5.4)	61.3(3.4)	60.0(7.8)
SMIRAC	8.8(1.3)	.0(.0)	2.5(.5)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
SMISTE	14.7(.5)	.0(.0)	2.5(.5)	.0(.0)	1.8(.5)	2.7(4.5)	.0(.0)
SOLCAN	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)
STRAMP	.0(.0)	3.6(.5)	.0(.0)	2.1(.5)	.0(.0)	.0(.0)	.0(.0)
THAOCC	50.0(2.5)	28.6(2.4)	17.7(2.2)	8.3(.5)	42.9(5.8)	29.7(3.7)	10.0(.5)
TIATRI	.0(.0)	.0(.0)	.0(.0)	.0(.0)	5.4(.5)	10.8(2.9)	.0(.0)
URTDIO	5.9(1.8)	3.6(30.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)	.0(.0)

***** CONSTANCY (AVERAGE COVER) TABLE *****

COMMUNITY TYPE NAMES

SPECIES ABBREVIATIONS	* PINALB/VACSCO * N = 10 *
***** TREES *****	
ABILAS	100.0(6.3)
LAROCC	10.0(.5)
PICENG	50.0(2.9)
PINALB	100.0(22.1)
PINCON	20.0(35.0)
PINMON	.0(.0)
POPTRE	.0(.0)
POPTRI	.0(.0)
PSEMEN	10.0(.5)
***** SHRUBS *****	
ACEGLA	.0(.0)
ALNVIR	10.0(.5)
AMEALN	30.0(1.3)
BERREP	.0(.0)
CEAVEL	.0(.0)
JUNCOM	40.0(3.0)
LONINV	.0(.0)
LONUTA	.0(.0)
MENFER	40.0(1.8)
OPLHOR	.0(.0)
PACMYR	40.0(2.4)
RIBLAC	.0(.0)
RIBVIS	.0(.0)
ROSAXX	10.0(.5)
RUBPAR	.0(.0)
SALIXX	10.0(.5)
SALSCO	.0(.0)
SAMRAC	.0(.0)
SHEPHE	.0(.0)
SORSCO	50.0(1.0)
SORSIT	.0(.0)
SPIBET	20.0(1.8)
SPIDEN	.0(.0)
SYMALB	.0(.0)
TAXBRE	.0(.0)
VACGLO	100.0(15.4)
VACSCO	100.0(20.4)
***** GRASSES *****	
CALAMA	.0(.0)
CAREXX	60.0(8.2)
CARGEY	20.0(1.8)
GRASSP	50.0(1.0)
JUNPAR	.0(.0)
LUZGLA	90.0(10.4)
LUZPAR	.0(.0)

***** FORBS *****

ACHMIL	20.0	(.5)
ACTRUB	.0	(.0)
ANAMAR	.0	(.0)
ANEOCC	.0	(.0)
ANTRAC	30.0	(2.2)
AQUFLA	.0	(.0)
ARECAP	20.0	(1.8)
ARNLAT	80.0	(2.9)
ASTCON	.0	(.0)
ASTENG	.0	(.0)
ASTERX	20.0	(.5)
ATHFIL	.0	(.0)
CALAPI	10.0	(.5)
CAMROT	10.0	(.5)
CASTIL	.0	(.0)
CHIUMB	10.0	(.5)
CIRSIU	.0	(.0)
CLAFLA	.0	(.0)
CLIUNI	.0	(.0)
DISHOO	.0	(.0)
EPIANG	30.0	(.5)
EQUARV	.0	(.0)
ERIFLA	30.0	(2.2)
ERIGER	20.0	(.5)
ERIPER	10.0	(.5)
ERYGRA	60.0	(2.2)
FRAVIR	.0	(.0)
GALTRI	.0	(.0)
GOOOBL	.0	(.0)
GYMDRY	.0	(.0)
HEDALP	.0	(.0)
HERSPH	.0	(.0)
HEUCYL	40.0	(1.8)
HYPSCO	.0	(.0)
LIGUST	.0	(.0)
LOMDIS	.0	(.0)
MIMLEW	.0	(.0)
MITBRE	10.0	(.5)
ORTSEC	.0	(.0)
PARFIM	.0	(.0)
PEDBRA	30.0	(2.2)
PEDCON	30.0	(2.2)
PEDRAC	40.0	(1.8)
PENLYA	10.0	(20.0)
PENSTE	20.0	(3.0)
POLLON	.0	(.0)
PTEAQU	.0	(.0)
RANUNC	10.0	(.5)
SENTRI	.0	(.0)
SMIRAC	.0	(.0)
SMISTE	.0	(.0)
SOLCAN	.0	(.0)
STRAMP	.0	(.0)
THAOCC	.0	(.0)
TIATRI	.0	(.0)
URTDIO	.0	(.0)

VALSIT	10.0	(.5)
VERVIR	.0	(.0)
VIOGLA	.0	(.0)
VIOORB	.0	(.0)
XERTEN	90.0	(25.6)

Appendix D

Community Type Similarity Tables

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	SLAB ROCK N = 18	ROCKLAND-GRASS N = 21	MESIC CAREX N = 9	HY-MES CAREX N = 11	MES-XERIC GRA N = 90	SALIX/CAREX N = 12	ALNINC/ATHFIL N = 5
SLAB ROCK	100.0	37.6	27.3	18.9	29.4	17.7	4.9
ROCKLAND-GRAS	37.6	100.0	19.3	16.3	38.4	16.4	8.3
MESIC CAREX	27.3	19.3	100.0	34.4	24.1	36.5	11.9
HY-MES CAREX	18.9	16.3	34.4	100.0	14.3	39.9	10.5
MES-XERIC GRA	29.4	38.4	24.1	14.3	100.0	19.0	14.4
SALIX/CAREX	17.7	16.4	36.5	39.9	19.0	100.0	18.2
ALNINC/ATHFIL	4.9	8.3	11.9	10.5	14.4	18.2	100.0
SPIDEN/SENTRI	26.6	23.2	22.3	20.3	29.1	25.0	25.4
RUBPAR/THADOC	16.6	18.9	13.5	15.4	24.2	23.6	35.0
RUBPAR/XERTEN	29.4	28.9	13.7	13.1	32.1	19.6	16.7

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	SPIDEN/SENTRI N = 29	RUBPAR/THADCC N = 31	RUBPAR/XERTEN N = 17
SLAB ROCK	26.8	16.5	29.4
ROCKLAND-GRAS	23.2	18.9	28.9
MESIC CAREX	22.3	13.5	13.7
HY-MES-CAREX	20.3	15.4	13.1
MES-XERIC GRA	29.1	24.2	32.1
SALIX/CAREX	25.3	23.6	19.6
ALNINC/ATHFIL	25.4	35.0	16.7
SPIDEN/SENTRI	100.0	42.4	38.2
RUBPAR/THADCC	42.4	100.0	40.8
RUBPAR/XERTEN	38.2	40.8	100.0

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	PACMYR/XERTEN N = 14	ACEGLA/RUBPAR N = 15	ACEGLA/SORSCO N = 26	ACEGLA/XERTEN N = 20	AMEALN/ACHMIL N = 26	VACGLO/XERTEN N = 31	VACSCO/XERTEN N = 7
PACMYR/XERTEN	100.0	25.3	35.9	50.8	44.4	57.2	37.6
ACEGLA/RUBPAR	25.3	100.0	58.1	39.2	28.7	26.6	13.2
ACEGLA/SORSCO	35.9	58.1	100.0	55.6	40.9	40.6	13.5
ACEGLA/XERTEN	50.8	39.2	55.6	100.0	42.6	48.5	20.7
AMEALN/ACHMIL	44.4	28.7	40.9	42.6	100.0	44.6	23.3
VACGLO/XERTEN	57.2	26.6	40.6	48.5	44.6	100.0	49.8
VACSCO/XERTEN	37.6	13.2	13.5	20.7	23.3	49.8	100.0
POTFRU/GRAMXX	21.3	15.4	16.5	18.2	16.6	20.4	22.5
ALNSIN/VIOGLA	22.7	43.2	49.1	33.8	23.4	28.8	12.3
ALNSIN/ATHFIL	26.7	45.1	52.7	37.9	25.1	29.2	13.3

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	POTFRU/GRAMXX N = 4	ALNSIN/VIOGLA N = 44	ALNSIN/ATHFIL N = 57
PACMYR/XERTEN	21.3	22.7	26.7
ACEGLA/RUBPAR	15.4	43.2	45.1
ACEGLA/SORSCO	16.5	49.1	52.7
ACEGLA/XERTEN	18.2	33.3	37.9
AMEALN/ACHMIL	16.6	23.4	25.1
VACGLO/XERTEN	20.4	26.6	29.2
VACSCO/XERTEN	22.5	12.3	13.3
POTFRU/GRAMXX	100.0	12.3	14.6
ALNSIN/VIOGLA	12.3	100.0	62.1
ALNSIN/ATHFIL	14.6	62.1	100.0

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	ALNSIN/XERTEN N = 2	ALNSIN/OPLHOR N = 8	ALNSIN/MENFER N = 10	ERYGRA/LUZHIT N = 13	SENTRI/ARNLAT N = 65	SENTRI/EPIANG N = 20	PSEMEN/VACGLO N = 25
ALNSIN/XERTEN	100.0	38.2	43.0	9.2	5.5	13.9	20.6
ALNSIN/OPLHOR	38.2	100.0	51.4	3.9	17.4	26.0	19.6
ALNSIN/MENFER	43.0	51.4	100.0	19.7	21.9	29.7	28.2
ERYGRA/LUZHIT	9.2	3.9	19.7	100.0	32.3	25.2	25.9
SENTRI/ARNLAT	5.5	17.4	21.9	32.3	100.0	38.1	21.1
SENTRI/EPIANG	13.9	26.0	29.7	25.2	38.1	100.0	30.5
PSEMEN/VACGLO	20.6	19.6	28.2	25.9	21.1	30.5	100.0
PSME/VAGL/XET	18.6	17.8	25.9	25.2	22.2	28.8	61.9
PSME/SYAL 1	15.6	14.3	17.4	20.3	18.0	32.2	43.9
PSME/SYAL 2	7.0	9.9	13.0	11.5	10.2	12.8	32.4
ABLA/CLUN/ARN	6.8	27.6	29.3	5.8	11.1	17.3	24.8
RUBPAR/EPIANG	14.8	27.5	34.7	22.8	26.7	41.1	34.5
PACMYR/EPIANG	15.6	20.8	27.1	20.3	21.2	35.4	40.4
ACEGLA/EPIANG	18.8	30.1	33.6	18.3	24.5	37.0	36.1
LAROCC/PACMYR	22.8	21.4	27.3	21.5	20.3	32.8	43.5
PSEMEN/PACMYR	23.2	23.0	32.9	21.3	22.1	25.9	55.2

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	PSME/VAGL/XETE N = 39	PSME/SYAL 1 N = 10	PSME/SYAL 2 N = 6	ABLA/CLUN/ARNU N = 1	RUBPAR/EPIANG N = 23	PACMYR/EPIANG N = 17	ACEGLA/EPIANG N = 52
ALNSIN/XERTEN	18.6	15.6	7.0	6.3	14.8	15.6	18.8
ALNSIN/OPLHOR	17.8	14.3	9.9	27.6	27.5	20.8	30.1
ALNSIN/MENFER	25.9	17.4	13.0	29.3	34.7	27.1	33.6
ERYGRA/LUZHIT	25.2	20.3	11.5	5.8	22.8	20.3	18.3
SENTRI/ARNLAT	22.2	18.0	10.2	11.1	26.7	21.2	24.5
SENTRI/EPIANG	28.8	32.2	12.8	17.3	41.1	35.4	37.0
PSEMEN/VACGLO	61.9	48.9	32.4	24.8	34.5	40.4	36.1
PSME/VAGL/XET	100.0	51.0	48.5	28.6	33.3	45.4	40.2
PSME/SYAL 1	51.0	100.0	43.3	18.8	32.7	49.1	40.9
PSME/SYAL 2	48.5	43.3	100.0	19.1	13.9	28.6	26.7
ABLA/CLUN/ARN	28.6	19.8	19.1	100.0	29.4	25.1	31.5
RUBPAR/EPIANG	33.3	32.7	13.9	29.4	100.0	52.6	51.7
PACMYR/EPIANG	45.4	49.1	28.6	25.1	52.6	100.0	53.6
ACEGLA/EPIANG	40.2	40.9	26.7	31.5	51.7	53.6	100.0
LAROCC/PACMYR	54.5	51.5	25.3	27.9	49.7	57.5	50.5
PSEMEN/PACMYR	59.5	40.4	31.3	36.0	35.5	41.7	40.2

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	LAROCC/PACMYR N = 26	PSEMEN/PACMYR N = 22
ALNSIN/XERTEN	22.8	23.2
ALNSIN/OPLHOR	21.4	23.0
ALNSIN/MENFER	27.3	32.9
ERYGRA/LUZHIT	21.5	21.3
SENTRI/ARNLAT	20.3	22.1
SENTRI/EPIANG	32.8	25.9
PSEMEN/VACGLO	49.5	55.2
PSME/VAGL/XET	54.5	59.5
PSME/SYAL 1	51.5	40.4
PSME/SYAL 2	25.3	31.3
ABLA/CLUN/ARN	27.9	36.0
RUBPAR/EPIANG	49.7	35.5
PACMYR/EPIANG	37.5	41.7
ACEGLA/EPIANG	50.5	40.2
LAROCC/PACMYR	100.0	49.7
PSEMEN/PACMYR	49.7	100.0

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	ABILAS/VACGLO N = 20	ABILAS/VACGLO N = 15	ABLA/CLUN/XETE N = 34	ABILAS/MENFER N = 59	ABILAS/MENFER N = 17	ABLA/CLUN/MEFE N = 64	ABLA/XETE/VAGL N = 27
ABILAS/VACGLO	100.0	45.4	55.0	57.3	48.7	47.8	39.3
ABILAS/VACGLO	45.4	100.0	48.1	36.5	47.4	42.5	47.4
ABLA/CLUN/XET	55.0	48.1	100.0	45.0	56.8	55.7	47.7
ABILAS/MENFER	57.3	36.5	45.0	100.0	57.3	60.3	36.2
ABILAS/MENFER	48.7	47.4	56.8	57.3	100.0	65.9	45.9
ABLA/CLUN/MEF	47.8	42.5	55.7	60.3	65.9	100.0	43.1
ABLA/XETE/VAG	39.3	47.4	47.7	36.2	45.9	43.1	100.0
ABILAS/VACGLO	48.3	53.6	54.8	41.2	49.7	46.8	58.4
VACGLO/XERTEN	40.6	43.9	43.0	37.9	39.6	37.9	43.5
ABILAS/VACGLO	40.7	45.9	45.6	40.3	44.9	44.4	50.9
ABLA/LUHI/XET	35.4	45.1	42.2	36.5	42.5	41.8	49.8
ABILAS/MENFER	43.4	39.9	44.2	55.8	60.5	55.6	42.7
ABLA/LUHI/MEF	42.0	43.3	48.9	53.0	59.4	60.6	44.5
ABILAS/LUZHIT	19.7	15.8	22.0	23.3	26.3	26.0	24.4
PINALB/VACSCO	25.0	36.7	31.0	24.5	32.7	26.6	47.8

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	ABILAS/VACGLO N = 34	VACGLO/XERTEN N = 28	ABILAS/VACGLO N = 79	ABLA/LUHI/XETE N = 48	ABILAS/MENFER N = 56	ABLA/LUHI/MEFE N = 111	ABILAS/LUZHIT N = 10
ABILAS/VACGLO	48.3	40.6	40.7	35.4	43.4	42.0	19.7
ABILAS/VACGLO	53.6	43.9	45.9	45.1	39.9	43.3	15.8
ABLA/CLUN/XET	54.8	43.0	45.6	42.2	44.2	48.9	22.0
ABILAS/MENFER	41.2	37.9	40.3	36.5	55.8	53.0	28.3
ABILAS/MENFER	49.7	39.6	44.9	42.5	60.5	59.4	26.3
ABLA/CLUN/MEF	46.8	37.9	44.4	41.8	55.6	60.6	26.0
ABLA/XETE/VAG	58.4	43.5	50.9	49.8	42.7	44.5	24.4
ABILAS/VACGLO	100.0	51.9	57.8	54.0	46.6	49.0	23.2
VACGLO/XERTEN	51.9	100.0	52.0	53.9	45.5	42.7	23.9
ABILAS/VACGLO	57.8	52.0	100.0	61.2	52.4	54.0	38.8
ABLA/LUHI/XET	54.0	53.9	61.2	100.0	49.4	53.8	44.5
ABILAS/MENFER	46.6	45.5	52.4	49.4	100.0	60.9	34.3
ABLA/LUHI/MEF	49.0	42.7	54.0	53.8	60.9	100.0	33.6
ABILAS/LUZHIT	23.2	23.9	38.8	44.5	34.3	33.6	100.0
PINALB/VACSCO	43.2	40.1	42.6	46.0	36.5	37.0	20.7

***** COMMUNITY TYPE SIMILARITY TABLE *****

COMMUNITY TYPE NAMES

COMMUNITY TYPE NAME	PINALB/VACSCO N = 10
ABILAS/VACGLO	25.0
ABILAS/VACGLO	36.7
ABLA/CLUN/XET	31.0
ABILAS/MENFER	24.5
ABILAS/MENFER	32.7
ABLA/CLUN/MEF	26.6
ABLA/XETE/VAG	47.3
ABILAS/VACGLO	43.2
VACGLO/XERTEN	40.1
ABILAS/VACGLO	42.6
ABLA/LUHI/XET	46.0
ABILAS/MENFER	36.5
ABLA/LUHI/MEF	37.0
ABILAS/LUZHIT	20.7
PINALB/VACSCO	100.0

VALSIT	14.7(1.0)	42.9(1.8)	48.1(2.1)	20.8(1.7)	37.5(2.5)	29.1(1.9)	40.0(2.7)
VERVIR	26.5(.5)	21.4(1.3)	31.6(.7)	22.9(1.0)	58.9(2.3)	46.8(1.4)	50.0(1.5)
VIOGLA	5.9(.5)	7.1(1.8)	1.3(.5)	.0(.0)	12.5(4.6)	7.2(2.0)	.0(.0)
VIOORB	.0(.0)	3.6(.5)	3.8(.5)	2.1(.5)	3.6(.5)	9.0(.8)	.0(.0)
XERTEN	100.0(34.5)	100.0(39.3)	94.9(32.8)	97.9(37.9)	87.5(19.3)	97.3(24.4)	50.0(-2.9)